

TOSHIBA'S TAKE
ON THE STYLUS SLATE

PC GAMING ON THE GO WITH
DIGITAL STORM'S VELOCE

ACER'S BUDGET-WISE
LIQUID E2 HANDSET

DISTRO

081613 #103

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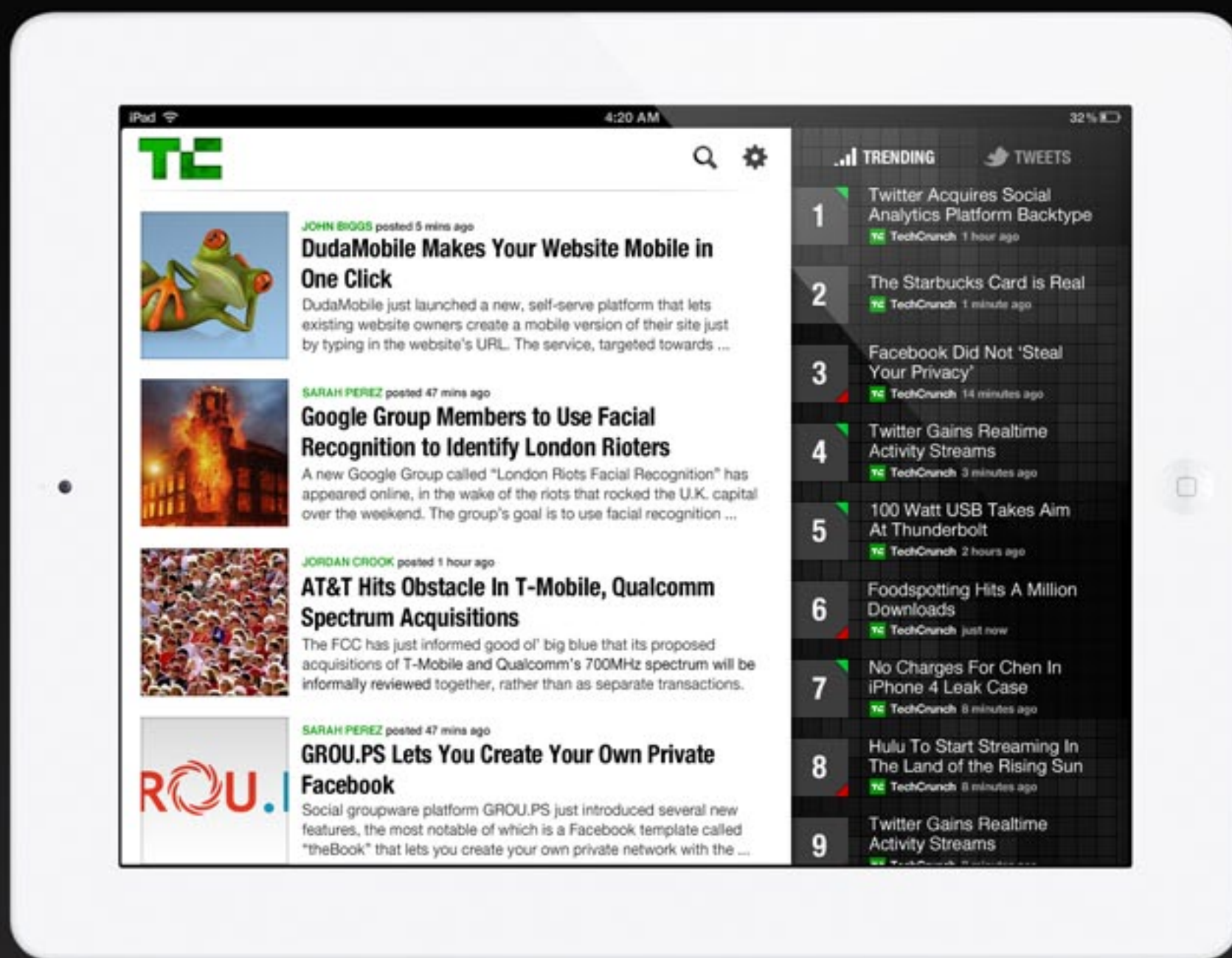
CONNECTING CAPE TOWN

INSIDE SOUTH
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ISSUE 103

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08.16.13

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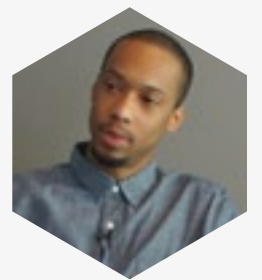
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REHASHED
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TM

TIME MACHINES
Time to Compute



IS HYPERLOOP LOOPY, OR THE FUTURE OF PUBLIC TRANSPORTATION?

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EDITOR'S
LETTER

IF YOU CAN SAY ONE THING about Elon Musk, the billionaire founder of Tesla Motors, it's that he thinks big. After making his fortune by selling his online payments company to PayPal, he's focused on creating entirely new industries, including commercial rocketry and electric cars. His latest idea, the Hyperloop, could eclipse both of those, at least in creative vision. The high-speed transportation system is basically a modern take on the pneumatic tube, and could potentially hurl travelers from Los Angeles to San Francisco at over 700 miles per hour, bridging the two cities in just about a half-hour. The cost to taxpayers: a mere \$6 billion.

Whether or not the Hyperloop ever gets built, it's already done something few public works projects ever have: kindled the imagination and excited everyone from tech writers to commuters. As Josh Fruhlinger says in this week's Distro, "The entire tech community screech[ed] to a halt this week, as Musk revealed the Hyperloop." The media reaction may have included skeptical com-

ments like the *LA Times* editorial that, as Josh points out, called the Hyperloop the "latest of many wacky LA transit ideas," but that hardly matters. When was the last time a high-speed rail system (OK, it's not technically a rail system, but still) got this kind of attention? Proponents of better public transportation in the US have watched for decades as bullet trains in Europe and Japan be-



“Whether or not the Hyperloop ever gets built, it’s already done something few public works projects ever have: kindled the imagination...”

came faster and more efficient, and the best America could offer was the Acela. Maglev? No thanks, we’ll take the car. The Hyperloop may never reinvent inter-city transportation in the way Musk envisions. But if his proposal reopens the debate over the future of such transit networks, it’s already served a valuable purpose.

From the futuristic skyways of California, this week’s Distro travels to the streets of Cape Town, South Africa, where companies like Google and Microsoft are trying to bring high-speed internet access to a country where ADSL is a luxury that costs over \$100 a month. As Darren Murph points out, while the new systems, which use “white space” spec-

trum borrowed from TV broadcasters, may initially benefit local ISPs and well-heeled consumers who can afford premium access, “it’s the second wave of beneficiaries that matter most. Due to the low cost of implementation, schools, libraries, restaurants, laundromats and untold other public facilities will soon have a viable and affordable option for getting connected.” Eventually, Darren says, the technology could reach impoverished communities throughout Africa “at a far more sensible cost” than other communication technologies, such as mass cellular rollouts.

Like Musk’s Hyperloop, it’s entirely possible that white-space internet will never achieve the mass appeal its investors are hoping for. But focusing public attention on the infrastructure and education needs of a struggling continent can’t be a bad thing. And given the track records of both Musk and Google, it’s entirely possible that in a few years, Californians will be shuttling up the coast in aluminum pods, and African schoolchildren will have the same access to the world of technology that kids in most other countries take for granted. 



MARC PERTON
EXECUTIVE EDITOR,
ENGADGET



CASTING A WIDE NET, HOTCAKE SALES AND GOOGLE JEANS



Touch article names
to read full threads

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INBOX



CAN THE DIMINUTIVE CHROMECAST ELICIT BIG CHANGES?

ISSUE 102,
AUGUST 9TH, 2013

“I think the biggest thing that’s going to happen with Chromecast is that every new high-end TV next year is probably going to include Chromecast support. That’s where a potential game changer is, rather than an add-on dongle. It becomes a standard of delivering internet content to your

WILL LG GET LUCKY WITH THE G2?

ISSUE 102,
AUGUST 9TH, 2013

“Hardware has (mostly) never been LG’s problem. It’s the software. If they’d take a page from Motorola’s book and do mostly stock Android with maybe a few added features, this would sell like hotcakes. (What *are* the sales figures for those things, anyway?)”

— JAYLANPHNX

TV rather than just one of a number of devices that can stream Netflix.”

— BRIANWRIGHT

“I’ve already ordered mine and see it as a luxury. I have a PS3 on my main TV that allows me to stream Netflix, YouTube and Amazon Prime with ease. I have a laptop with HDMI out for streaming local content. The Chrome-

cast will get hooked up to my bedroom TV and is perfect for streaming Netflix, which is mostly what I watch in bed. I’m under no illusions that this will cause me to cut the cable cord, but it certainly makes my life easier and is worth the price... especially since I ordered early and get the 3 free months of Netflix.”

— GEORGERPERRY



“It will certainly change things. But it is still logging on with your device and casting to your TV. The real disruption will come when you log on with your TV directly onto the web. This is an intermediate step.”

— **MOTMAITRE**

“I’ve had Chromecast for about a week and thus far it isn’t changing the world. The article talks about the cumbersome interface on Roku, but I’m wondering just what is meant there. Roku has content, lots of it, and Chromecast doesn’t. Right now Chromecast streams Netflix, Youtube, and Google Chrome running on a PC to an HDMI equipped TV. That’s it, end of story. The competition being Roku, Google TV, Apple TV, Boxee Box, Xbox 360 and the PS3 all have much more content available. For \$35 Chromecast is a fun toy but content wise it’s going to need to have a lot more going for it than it has now.”

— **JEFFSTRAILEY**

CASTING LIGHT ON THE CHROMECAST

ISSUE 102,
AUGUST 9TH, 2013

“Coming from a three-generation Roku owner: I love the Chromecast. It is so much faster to get Netflix content on the screen, long before the Roku app even loads my queue. It hasn’t replaced it yet, but once the content players start arriving, the Roku might start feeling left out!”

— **PAULTOBECK**

THE DAY GOOGLE DIED

ISSUE 102,
AUGUST 9TH, 2013

“Yeah, well, I want a Google car. I’ll look good in it wearing my Google jeans.”

— **THEHTPC.NET**

“You can’t compare apples to oranges. A Pontiac GTO and early IBM computers were one-trick ponies. Google’s services are so much more expansive. Its consumer base is inherently more diverse, and its potential for having its hands in the future isn’t one or two products — it’s

a whole line up. My money is on Google.”

— **MARCUSZIEMKE**

“On the other hand there is Coke, Ford, AT&T, GE, HP... brands that have been around forever and are still either dominant or stay very competitive.”

— **JAZXXL**

MOTO X

ISSUE 102,
AUGUST 9TH, 2013

“I think we need to all step back and reconsider the spec race... Don’t get me wrong, I have enjoyed it as much as anyone, but isn’t actual usage performance more important. The author says that the phone is super snappy and that the resolution is hardly a step down from 1080, and yet those are the only specs he cites as why this phone is inferior to other \$200 smart phones.”

— **TGBTG.NOAH**

“I like this phone. Battery life [and] customization are appealing ... Price will come down, just give it a month it two.”

— **KOOL1**



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ORGANIC TRANSIT ELF

Tap for
detail



SOLAR
CHARGE



CARGO
HAULING



LEG
ROOM

ELECTRIC PEDAL POWER

Sometimes the pedal-powered commute around town could use a power boost. The folks at Organic Transit in North Carolina have designed the ELF to do just that. The vehicle is still powered by foot and can go most places two wheels are allowed, but electric assist helps get those groceries back without a complete burnout.

THE DAMAGE: \$5,000 & UP



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ORGANIC TRANSIT ELF

LEG ROOM

A spacious interior offers a comfy commute that's aided by disc brakes, turn signals and relief from any sudden rain showers.

PHOTOGRAPHS BY DANA MURPHY



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ORGANIC TRANSIT ELF



CARGO HAULING

A dedicated cargo hold provides enough trunk space to get a load of groceries back from a shopping expedition.

PHOTOGRAPHS BY DANA MURPHY



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ORGANIC TRANSIT ELF



icTransit.com

SOLAR CHARGE

In addition to the regular ol' plug-in charging that can juice up the ELF in less than an hour, a rooftop solar panel sorts the same chore and can handle a full charge in about seven hours.

PHOTOGRAPHS BY DANA MURPHY





SAMSUNG 55-INCH CURVED OLED TV



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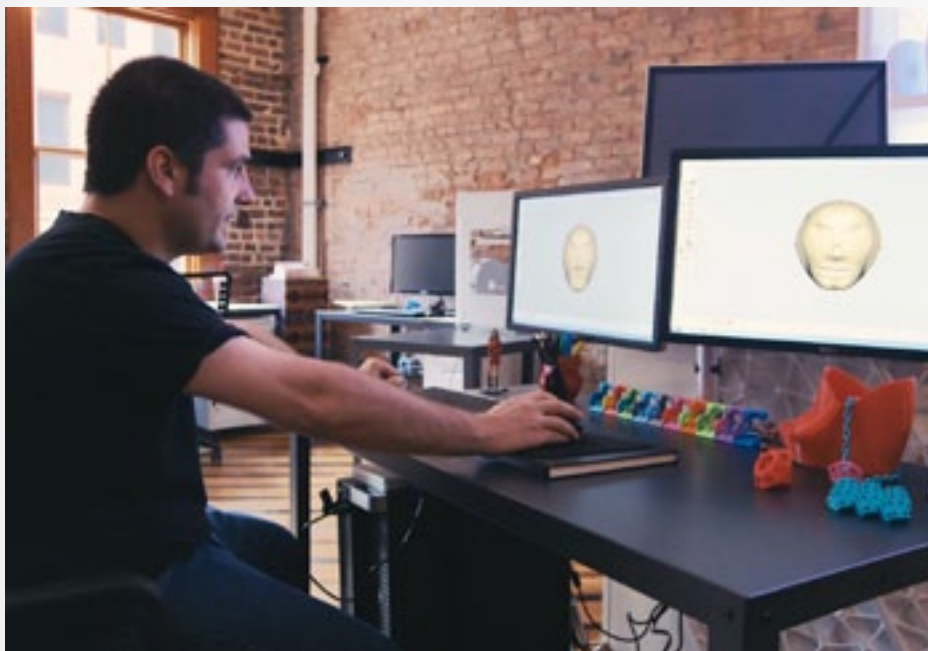
Any way you look at it, nine thousand dollars is a heck of a lot to spend on a television. But in the case of Samsung's 55-inch Curved OLED set, it's a fair share less than the \$15,000 we heard quoted just last month. Just like LG's equivalent, the Samsung KN55S9C was designed with a curved profile in order to "envelop" viewers — your viewing experience is improved, in theory, because you're more immersed in the display. The OLED set includes the company's Multi View feature, which lets two people watch different programming at the same time when using compatible active 3D glasses, and it's compatible with the Evolution Kit Samsung introduced at CES. The 55-inch KN55S9C is on its way to select retailers, and can be yours for the considerable sum of \$9,000.

PRICE: \$9,000

AVAILABILITY: NOW AVAILABLE

THE BREAKDOWN: THE KN55S9C OFFERS AN ALMOST IDENTICALLY IMMERSIVE VIEW TO WHAT WE SAW AT CES.





CUBIFY SCULPT

There's been a fundamental disconnect for as long as desktop 3D printers have been an affordable reality: how can consumers easily create 3D models to be printed? At the moment, the best solutions for finding objects to 3D print are databases like Thingiverse — places where you can search for and download files that most closely match what you're looking to create. The shortcoming with such systems is clear: what happens when no one's taken the time to create the files you want?

That's where software solutions come in, and 3D Systems has been hard at work on a product it's sure will help bridge the gap between your imagination and the print platform. Cubify Sculpt is a sort of Photoshop for 3D printing, a simplified tool that doesn't require any sort of knowledge in the world of CAD to help make an idea a 3D-printed reality. Sculpt really is an apt

PRICE: \$129.99

AVAILABILITY: NOW AVAILABLE
(WINDOWS ONLY)

THE BREAKDOWN: 3D SYSTEMS' SOFTWARE SOLUTION OUTFITS USERS SO THAT THEY NO LONGER HAVE TO RELY ON EXISTING 3D PRINT FILES.

name here. When you start, you're essentially given a lump of round computer clay. You can add or remove material, smooth, elongate and generally bend it to your will. If the object you've got in mind is symmetrical, you can mirror the image for faster, more accurate results.

Playing around with Sculpt a bit, it's easy to get carried away. It can be tricky, however. The results aren't exactly precise when you're doing something simple like sculpting a face. Unless you can become a real Sculpt artist, this aspect of the software will likely be little more than a fun tool.

The applications are a lot more compelling, however, when it comes to things like mashups. The really cool thing here is that you can import a 3D file and adjust or add to it as you see fit. In one creepy example, 3D Systems CEO Avi Reichental's face was added to the body of a sphinx. Once imported, fixing things up is fairly easy. You can re-size, rotate and smooth out connections. When you're all done, you can either print it up at home or send it to 3D Systems to have the company print it up with one of their industrial devices.



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SPHERO 2.0

A robotic ball you control with your phone? What's not to like? Well, we managed to find a few things when we took a look at the first generation back in 2011 — that's what we do. Most of the criticisms of the original Sphero came down to pricing and the admittedly short list of things it could actually do at the time. Orbotix has made some improvements since then, and more importantly, the open API has given users a much fuller experience, with around 20 or so compatible titles currently available on the iPhone.

This month, the company is refreshing the device itself, with the simply titled Sphero 2.0. The particularly astute among you will no doubt notice that nothing has really changed here from an aesthetic standpoint. There have been some hardware changes to the toy, but everything's on the inside, namely brighter lights and faster speeds. The

PRICE: \$129

AVAILABILITY: AUGUST 2013

THE BREAKDOWN: THE SECOND-GEN MODEL IS PACKED WITH IMPROVED INTERNALS, BRIGHTER LIGHTS AND BREAKNECK SPEEDS.

new Sphero tops out at seven feet per second, a speed due in part to a lower center of gravity. We had the opportunity to play with the ball at top speed, and indeed the thing hauls. In fact, it's a bit hard to control out of the box. Thankfully, there's a speed controller in the app — better still, you'll actually have to work up to those sports car-like speeds. Our unit was, admittedly, topped up. By playing games with it, you begin to level up, making the ball faster and faster as you go along.

The color lights inside have been improved as well, with three times the brightness of its predecessor. Though, like the last version, the entire body doesn't actually light up due to the opacity of internal components. Orbotix suggests you put on some sunglasses so you don't blind yourself, but don't worry. The company also claims the 'bot is "smarter," though we've yet to see those brains really manifest themselves — perhaps when more apps take advantage of the brighter ball. Interested parties can also pick up the special edition Sphero Revealed, a \$129 Apple Store exclusive, which features a partially transparent shell, giving you a peek at the ball's inner workings. 



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YOUTUBE VIEWS



HOURS OF VIDEO



The Heroes of YouTube

Bruce Wayne may be on permanent vacation with Selina Kyle, but that hasn't stopped Batman from topping YouTube's list of most popular superheroes. Based on views and amount of content, the Dark Knight is number one, racking up 3 billion pairs of eyes on 71,000 hours of video. That's potentially 213 *trillion* hours spent watching the antics of a flying man with daddy issues — or roughly 42,000 views per hour of footage. More surprising than that though, is who came in second place. It wasn't Spider-Man (seventh with 340 million views of 7,400 hours of video) or Tony Stark (fourth with 1.4 billion views of 20,000 hours of video). If you heard thunder, you heard right. Thor has 2.1 billion views and 66,000 hours of video, but only around 32,000 views per hour of tape. What does it all mean? Mjolnir's owner is around 33 percent less popular (views per hour) than Gotham's First Son — and he's a *god*. Ouch. — *Timothy J. Seppala*



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YOUTUBE VIEWS

HOURS OF VIDEO

BATMAN

3 Billion
71,000 Hours

The Heroes of YouTube

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SOURCE: YOUTUBE TRENDS BLOG. ILLUSTRATIONS: TROY DUNHAM



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YOUTUBE VIEWS

HOURS OF VIDEO

THOR

■ 2.1 Billion

■ 66,000 Hours

The Heroes of YouTube

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HOURS OF VIDEO



SUPERMAN

■ 1.7 Billion

■ 14,000 Hours

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HOURS OF VIDEO



IRON MAN

■ 1.4 Billion

■ 20,000 Hours

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YOUTUBE VIEWS



HOURS OF VIDEO



THE AVENGERS

1 Billion
31,000 Hours

The Heroes of YouTube

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YOUTUBE VIEWS

HOURS OF VIDEO

WOLVERINE

■ 540 Million

■ 7,800 Hours

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YOUTUBE VIEWS

HOURS OF VIDEO

SPIDER-MAN

■ **340** Million
■ **7,400** Hours

The Heroes of YouTube

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YOUTUBE VIEWS

HOURS OF VIDEO



**CAPTAIN
AMERICA**

■ **280 Million**

■ **4,900 Hours**

The Heroes of YouTube

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YOUTUBE VIEWS

HOURS OF VIDEO

THE JUSTICE LEAGUE

■ 220 Million

■ 3,200 Hours

The Heroes of YouTube

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YOUTUBE VIEWS

HOURS OF VIDEO



DEADPOOL

200 Million

8,900 Hours

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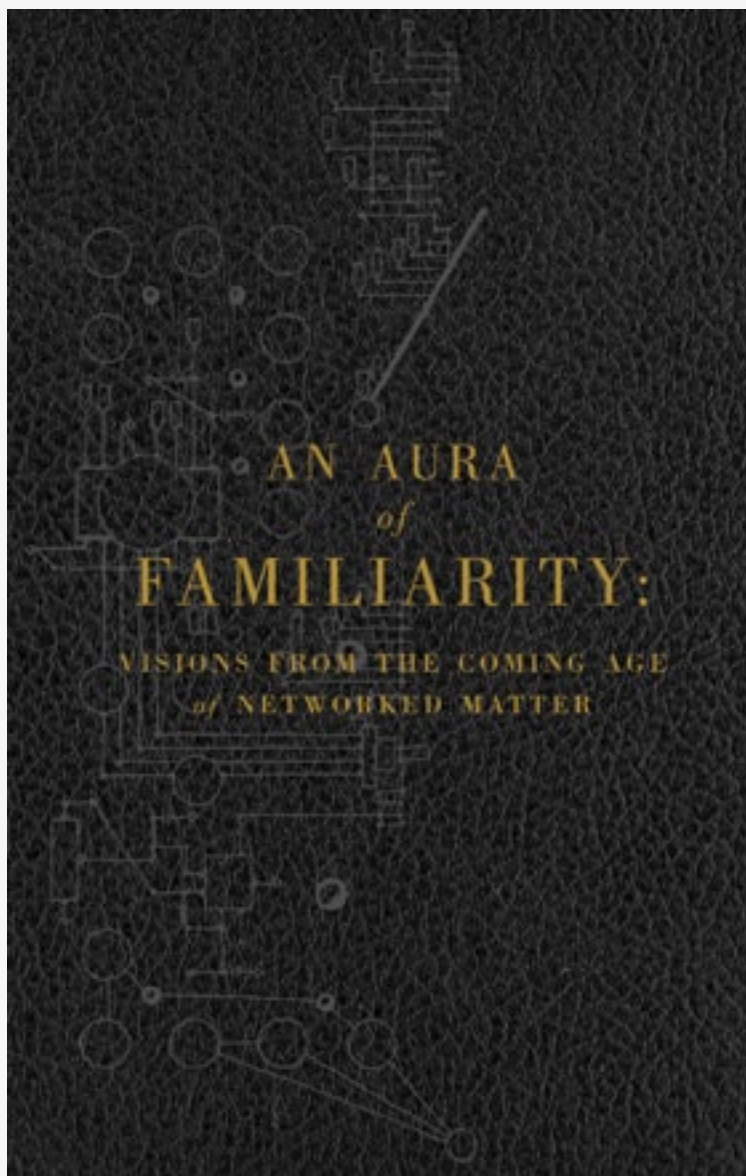
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An Aura of Familiarity: Visions from the Coming Age of Networked Matter

Institute for the Future

Earlier this summer, the Institute for the Future began releasing short stories it had commissioned as part of its Technology Horizons Program. Now, those have all been collected in *An Aura of Familiarity: Visions from the Coming Age of Networked Matter*, an e-book that can be downloaded for free in PDF form. In it you'll find new work from Cory Doctorow, Rudy Rucker, Warren Ellis, Madeline Ashby, Ramez Naam, and Bruce Sterling (complete with illustrations by Daniel Martin Diaz), each of whom were asked to "envision a world where humans have unprecedented control of matter at all scales." The stories can also be found individually on the [IFTF website](#), and on [Boing Boing](#), where they made their debut.



Omni Reboot

By Claire L. Evans et al

Omni Reboot

Omni magazine is back, sort of. Launched earlier this month, *Omni Reboot* is looking to carry on the legacy of the legendary science / science fiction magazine, and it's certainly set off on the right foot, featuring new fiction from Rudy Rucker and Bruce Sterling, plus an interview with original *Omni* editor, Ben Bova.



Click on
headlines
to read full
stories

Facebook Fauxlore: Kerouac, Burroughs, and a Fight Over the Oxford Comma That Never Was

By Alexis C. Madrigal, *The Atlantic*

We've all seen obviously fake things catch hold and spread across Facebook, but some cases are a bit more complicated. In this piece, Alexis Madrigal looks at how one tall tale featuring Jack Kerouac and William S. Burroughs proved too good to be true and took on a life of its own.

How One Local Bookstore Is Dealing with the E-Book Revolution

By Harry McCracken, *Time*

The last decade or so has been a challenging time for large and small bookstores alike. Here, *Time*'s Harry McCracken checks in with one independent bookseller in San Francisco to see how it's faring with its experiment selling Kobo e-readers in its store alongside actual books.

The Science Behind the Netflix Algorithms That Decide What You'll Watch Next

By Tom Vanderbilt, *Wired*

Wired's Tom Vanderbilt talks to Carlos Gomez-Urbe and Xavier Amatriain, two of the people behind the sometimes useful, sometimes amusing Netflix recommendations, and finds out exactly how the company makes those connections — hint: there are a lot of people backing up its algorithms.



WINDOWS RETREAT

DISTRO
08.16.13

FORUM



SWITCHED
ON

BY ROSS RUBIN

Today's hottest and best-selling tablets and smartphones have one thing in common: they are powered by ARM processors. Offered in such variations as NVIDIA's Tegra, Qualcomm's Snapdragon, Samsung's Exynos and Apple's A6, ARM processors dominate the leading edge of mobile products. At LG's recent announcement of its clever and well-appointed G2 smartphone, much was made of it being the first globally launched phone to include Qualcomm's Snapdragon 800; Android, in contrast, wasn't mentioned once. And the long reach of ARM extends far beyond the bleeding edge. The Hisense Sero 7 Pro — recently cut to \$129 just a few weeks after its launch— has a Tegra 3 processor while ARM chips from Rockchip and MediaTek power Android tablets at even humbler price points.

For years, Intel has promised it would be competitive with ARM in terms of performance per watt (if not in price). It has made great strides both in its smartphone-focused Atom chips and its performance-oriented Core chips (including Haswell, the

CPU behind the MacBook Air's huge gains in battery life), but those in the ARM camp have kept their processors' competitive heat up while keeping their generated heat down.

And so, for the first time since Windows NT made the failed leap to processor architectures such as Alpha, PowerPC and MIPS on the desktop, Windows supported an alternative to the x86 architecture. Like iOS and Android, but unlike previous desktop versions of Windows, Windows RT could not be removed or re-installed from a disc.

Casting aside backward compatibility, Windows RT has a strange relationship with its x86-based sibling. On one hand, the ARM-based OS has competed with Windows 8 for the mindshare of manufacturers and market share with consumers. On the other hand, it has depended on the sales of Windows 8 to help attract developer attention for "Modern" Windows apps that are its lifeblood. And as it has turned out so far, the lack of apps for Windows RT has more to do with sluggish sales of Windows 8-based touch systems than its own slow



“Dwindling manufacturer support raises major questions about the future of Windows RT.”




The VivoTab RT is ASUS' lone Windows RT offering.

sales. Windows RT inspired some of the sleekest PCs with some of the longest battery life — particularly when paired with battery-equipped keyboard docks — that we've ever seen.

And yet, such was the head-scratching response to Windows RT that HP, Acer and Toshiba sat out the operating system altogether. Most other major PC manufacturers bet on one model, usually with an interesting form factor. These included Lenovo's IdeaPad Yoga and ASUS' VivoTab RT. But, with sales flagging, both also offered Intel-based versions of their products. Then, of course, there was Microsoft, which shipped the Surface RT well in advance of its much more

expensive Surface Pro. In doing so, it mimicked the pricing distance between Apple's iPad and MacBook Air.

Now ASUS has said that it won't be returning to the Windows RT market. Dell, which made the XPS 10 (a detachable device similar to the VivoTab RT), is in the throes of a privatization that may force it to focus on products with more momentum. As for HP, it has embraced an ARM-based detachable tablet. But, like the ASUS Transformer tablet / keyboard detachables, it runs Android.

Dwindling manufacturer support raises major questions about the future of Windows RT. Next week's Switched On will address a few possible scenarios for the struggling operating system. 



HYPERLOOP: WE CAN DO THIS



DISTRO
08.16.13

FORUM

THIS IS THE
MODEM WORLD

BY JOSHUA FRUHLINGER

So Elon Musk revealed his vision to build a roller coaster between LA and San Francisco. The reaction, at least so far, has been positive and dreamy. At first, Musk said he wasn't going to build it, but clearly as a reaction to the love we've thrown his way, he plans to build a "demonstration article."

Can we please, please make this happen?

California has \$9 billion in bonds set aside to build a high-speed rail between Los Angeles and San Francisco. Musk estimates that by the time they're done building it, it will cost the state \$100 billion. While California's budgeteers have their hearts in the right place, it's obvious — at least to me — that we need to grab them by the ears and force them to take a look at Musk's plan. For our sanity. For our budgets. For our future. And because it'd be really cool.

Other reactions have been skeptical: We've seen trains-in-tubes hundreds of times before; what makes this one any different? Sure, Musk has an excellent track record and has produced a large

document addressing safety and even maintenance concerns, but who's to say that this thing will actually work? Is this more pixie dust dripped on a public in need of visionaries?

No. This is the guy who made electric cars work, who has people lining up to buy \$80,000 Teslas without test drives. The Hyperloop will work, and Musk will deliver a working prototype that we can and should make happen.

I watched the entire tech community screech to a halt this week as Musk revealed his plans for the Hyperloop. A day after the announcement, virtually every mainstream outlet ran headlines to the tune of "A 700MPH Ride in a Tube," making it sound more like a Disney ride than a realistic plan. Almost at the same time, bloggers took to the social sphere to sadly declare that while the Hyperloop sounds cool, no one will ever build it.

An *LA Times* headline from August 13th reads, "Elon Musk's Hyperloop latest of many wacky LA transit ideas," implying that Musk's concept is in the same fantasy world as monorails, LA River hovercrafts and even camels. Yes, somehow Musk's Hyperloop concept is



“Let’s stop the negativity. Let’s recapture that ‘50s spirit when we didn’t care if flying cars and neutron pistols would kill us all.”

apparently just as silly as riding camels through downtown Los Angeles.

Let’s stop with the negativity. Let’s recapture that ‘50s spirit when we didn’t care if flying cars and neutron pistols would kill us all. Let’s recapture that Wright Brothers spirit in which a broken leg or two isn’t going to stop us from getting from LA to SF in 35 minutes.

So this is me asking someone, somewhere who knows what he or she is doing to step forward and build this thing. Perhaps a company like Terraspan, which ominously shut down most of its website after Musk’s announcement, can get its head around the concept and push forward with California footing the bill?

Perhaps all of you newly rich tech visionaries making money off of social-aggregation engines can put the Scotch down and throw some of your financial and brain power at Hyperloop and really disrupt humanity.

Now that the major press has digested Musk’s plan, it’s time for the state of California to do the same. Where’s Governor Jerry Brown’s response to the idea? Are they taking this seriously?


So here’s what I propose: You, me, us — the geeks of the world need to ensure that our friends and relatives

take Hyperloop seriously. If you don’t believe in Hyperloop, that’s fine, and I understand. I was, at first, not comfortable with the notion of plopping myself into a steel tube that would shoot me along Interstate 5 at 700MPH. But then I imagined what my grandparents must have thought of the first commercial jet and I manned up.

Imagine being able to head to San Francisco for a lunch appointment from LA in less than an hour and being back for dinner. Imagine what Hyperloop will do for intellectual commerce, joining Silicon Valley with Silicon Beach (or whatever they’re calling LA’s burgeoning tech community this week). The upside is tremendous.

Put your head around this: lunch at San Tung and dinner at Paco’s Tacos. That is, pretty much, all you need to tell your friends and family.

People compare jets to rockets filled with people. People compare Hyperloop to shotguns or cannons filled with people. We got over the former. We can get over the latter.

It’s up to us, the self-selected nerds of the world, to explain to the Luddites how this thing will work, how the science of it all makes sense and how this isn’t another Disney Monorail. We can do this. 



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**Acer
Liquid
E2**



**Digital
Storm
Veloce**



**Toshiba
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Write**



ACER LIQUID E2



Acer's new **Liquid E2** budget-priced handset lands squarely in the market for those with unassuming expectations
By Daniel Cooper

Whenever we review a budget smartphone, our job is to weigh the handset's cost against its similarly priced rivals. You'd hope, for instance, that if you spent \$500 on a device, you'd be getting your money's worth no matter which manufacturer or ecosystem you chose. If it's only \$300, then you have to consider if the particular set of compromises made to reach this price point were the right ones. Acer's Liquid E2 (V370), for instance, just landed at ThreeUK SIM-free for around £150 (\$232) earlier this week. But even at £17 (about \$26) per month



with no up-front fee, is it worth signing away the better part of two years to own one? Given that it's in the same price range as the Samsung Galaxy Ace 2 and HTC Desire C, should you be picking this handset when it's time to upgrade?

HARDWARE

Whip the 140-gram (4.9-ounce) E2 out of the box and the first things you'll notice are its reassuring heft and sturdy chassis, which give the impression that it can take a beating while you're out in the field. Unfortunately, we did manage to drop the phone (from waist height) on some gravel, which scuffed the bezel and reminded us that clumsy users should probably invest in a case.

Rather than the usual earpiece slot, your ears will be pushed up against a curved cut in the front frame that reveals a recessed speaker grille done up in hot-rod red. It may be a small touch, but that one little flourish serves to liven up the otherwise clinical design, giving it a much-needed injection of personality. While our review unit is white, the same red flash is present on the black version too. Below the earpiece, you've got the company logo,

while to the left you'll find the forward-facing VGA camera. Beneath the display are the usual trio of capacitive buttons and the primary microphone. The mic's placement is telling, since it's cut out of the bezel on the right-hand side, and with this asymmetrical alignment, it's clear that the E2 is designed to be held in your left hand — after all, if you held it in your right, the microphone would be getting far too cozy with your jowls.

Going around the frame, the left side is blank, while the right edge is home to the volume rocker. Up top, you've got the 3.5mm headphone jack and the power / screen button, while down below is a micro-USB port. Flip the handset over and you'll notice that Acer wasn't content to just include a rear-facing speaker where it's convenient. Instead, the company has added a pair of circular speaker grilles at either end of the

The E2 offers an 8-megapixel shooter and LED flash.



back cover that resemble tiny pizza plates (more on that later). Tucked beneath the uppermost of the two are an 8-megapixel camera, LED flash and secondary microphone. The lower speaker, meanwhile, adjoins the gap in the plastic where you can pull off the E2's rear cover, which features the customary creaking and snapping sounds so frequently associated with a flimsy plastic back cover.

Still, lift the back cover away and you'll find a 2,000mAh battery, a full-size SIM slot (yep, it's 2013) and a microSD slot with support for cards as large as 32GB. Internals-wise, the device packs a 1.2GHz quad-core MediaTek MT 6589 Cortex-A7 CPU paired with 1GB of RAM and a slender 4GB of internal storage, of which around 1.6GB is actually available for you to use. We aren't big fans of phones with this little storage, but at least the microSD card expansion enables us to grin and bear it — as will you if you decide to buy this. As for radios, the E2 only offers HSPA+, so you won't be able to take advantage of the UK's burgeoning LTE revolution, unlike some other recently released handsets.

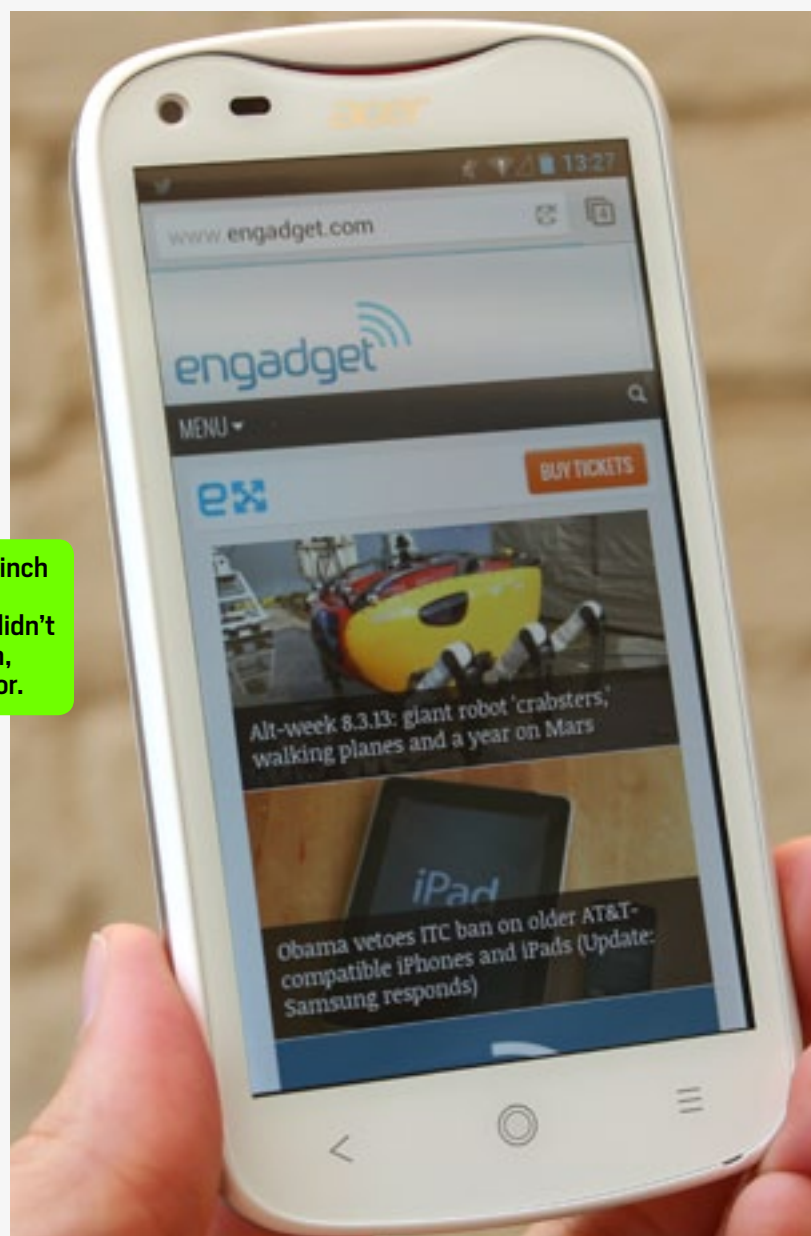
DISPLAY AND SOUND

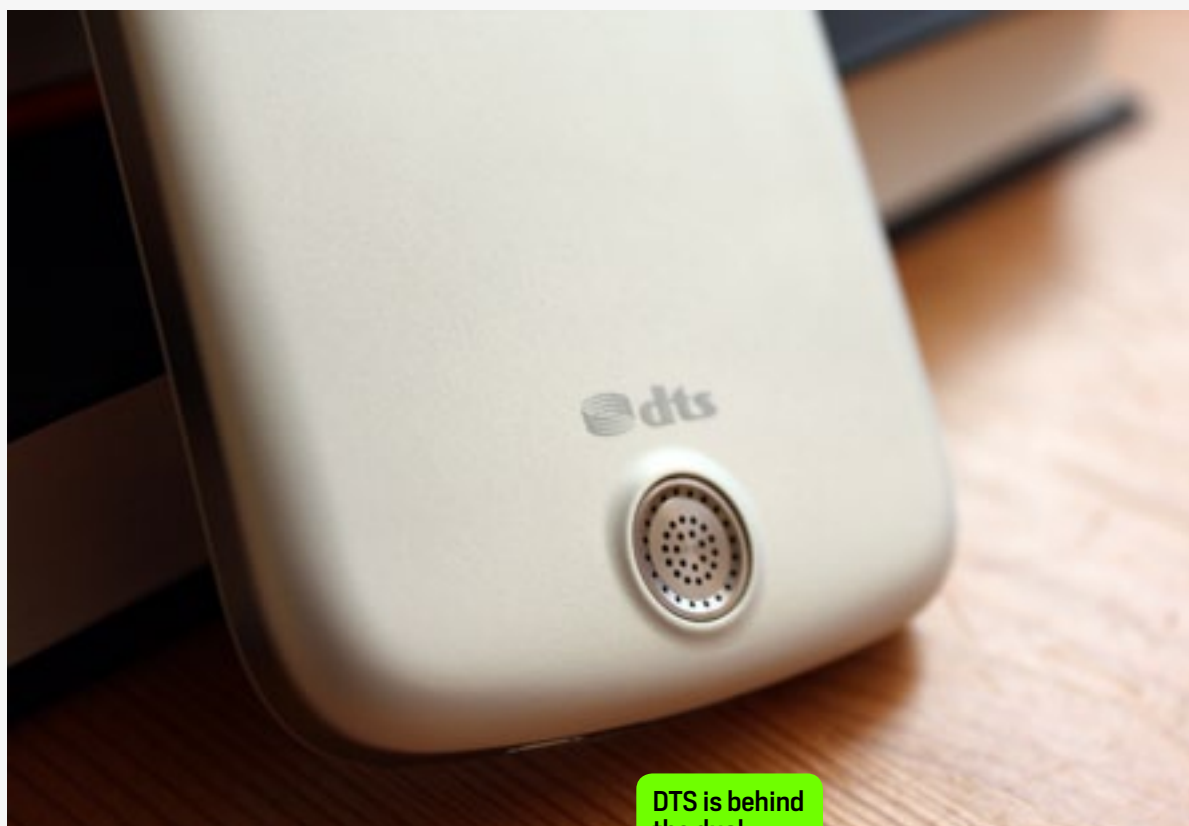
The Liquid E2's 4.5-inch, IPS LCD, non-PenTile, qHD display gives you a pixel density of 245 ppi and we think that's a reasonable stat given its budget status. Understandably, however, there

are some caveats you should be aware of. First up, video reproduction is adequate, but we did find that colors were washed out no matter how we tinkered with the display. Then there's the backlight, which struggles in strong sunlight, although it's not as bad as some handsets we've seen of late. Finally, in the right light and with the display off, it's very easy to see the LCD matrix beneath the glass.

Acer's most radical design decision was to include a pair of circular speakers at either end of the E2's rear cover. The company has also included a grand DTS logo to boast about this handset's

The 4.5-inch IPS LCD display didn't offer rich, vivid color.





DTS is behind the dual speaker grilles on the Liquid E2.

audio prowess, and we think in doing so Acer has made a rod for its own back. You see, it's a constant complaint of ours that rear-mounted speakers are only as good as the likelihood that you won't cover them with your hand while holding it. In this instance, Acer tinkered with the sound so that it's mostly coming out of the lower speaker, which would be on the right-hand side if you hold it in landscape. Understandably, that's only right if you're right-handed, so south-paws who were hoping to annoy their fellow commuters with a blast of obnoxious music should look elsewhere.

Having suitably raised our expectations, however, the E2's audio quality earns more than a few demerits. While streaming video on BBC iPlayer and Netflix, as well as playing locally stored movies, we found the mono sound was weak and tinny. The bundled DTS soft-

ware panel doesn't help matters: whenever we hunted to find a setting that eliminated the weak audio, we were left with rattling speakers and scratchy audio. While the DTS feature boosts the volume of the speakers (which are too weak on their own), it's also a one-way ticket to rattle town.

In the end, we found it was better for our mental health (and that of our neighbors) to disable the DTS panel altogether and use headphones instead.

SOFTWARE

Does your wallet not stretch as far as a "Google Play edition" handset, and do you wish that a "name" brand phone maker would keep its pernicious skinning to itself? Well, Mr. and Mrs. Acer have just leapt to the top of your Christmas card list. Yes, there are some minor tweaks to the Jelly Bean experience (the phone ships with Android 4.2.1), but essentially, you're experiencing as close to stock Android as Acer can make it.

In terms of changes and bloatware, there's a Sense 4-esque calendar and weather widget, and perhaps most notably, the DTS Audio panel that we've already discussed. Suffice to say, it





wasn't long before we'd just switched off its helpful attempts to "improve" our audio, and hope that it doesn't bother us again. On the upside, power users will be delighted to see that Swype has been installed as a keyboard option and can be activated from the get-go by hitting the toggle on the bottom-left corner of the screen. Users will also get access to AcerCloud, the company's platform that lets you sync photos, videos, music and documents to any other Android or Windows devices that have the app — which we discussed in far greater detail in our review of the CloudMobile.

CAMERA

Since even lower-end smartphones now come with a good 8-megapixel primary camera, we were expecting more from the E2. Unfortunately, we were disappointed by our washed-out sample shots, which lacked crispness and detail. Fatally, too, the camera has difficulty dealing with high-contrast images taken on a bright summer afternoon. The backside-illuminated autofocus module doesn't handle close-up or long-distance shots too well, with vibrant flower colors dialed down and the images winding up pretty noisy. HDR photography doesn't really improve the





Test shots
were often
washed out
and lacked
detail.

situation and, as usual, users and their subjects are required to stay perfectly still or else the pictures will emerge all ghosted. By default, the forward-facing camera is set in “Face Beauty Mode,” which, like Nokia’s Glam Me, aims to digitally screen out users’ visible wrinkles. Unfortunately, even when we dialed the cosmetic settings up to full, it didn’t really improve my skin tone — reminding me that I really need to up my game when it comes to cleansing and toning.

Unsurprisingly, these results carry over to the video, with the E2 offering faded colors, fuzzy images and very little detail. The clips are also heavily compressed with a data rate of 1.06 MB/s. Generally speaking, we wouldn’t feel comfortable using the camera to document precious life moments. As for

sound, the secondary microphone picks up a lot of wind noise, which is a shame given that we were hoping that the two mics would help to screen some of the distortion out.

PERFORMANCE AND BATTERY LIFE

The marriage of a 1.2GHz quad-core Cortex-A7 with 1GB RAM shouldn’t make for the fastest of devices, but the Liquid E2 never feels as if it’s been built on the cheap. While some credit should go to Project Butter, Acer has at least put together a usable piece of hardware. The handset was surprisingly responsive and hardy in the multi-tasking department, taking it on the chin when we flipped through seven or eight apps at once, flipping between audio, streaming video and a cached movie. While performance may have slowed a little, it didn’t stutter or fail



Remember to ensure your expectations are suitably lowered before taking the plunge.

as we've seen on other handsets, and we're happy to commend the E2's chops in this department. High-performance games like *Riptide GP* and *Temple Run 2* were also dispatched with relative ease, with stutters kept to a surprising minimum.

Drilling down into the E2's benchmarks, we see this phone doesn't sweep the board. Though it bests the ill-fated

HTC First in the SunSpider browsing test, it lags badly in graphics tests. It shouldn't be too surprising to see that big-ticket graphics performance is beyond the ken of this device, but it'll certainly handle less demanding tasks like using Twitter and checking into Foursquare. On the subject of boot-up times, the E2 will launch after 30 seconds and shut down in around six, which is certainly acceptable for a device in this class.

A 2,000mAh battery is becoming an increasingly standardized smartphone spec, and we had reasonable expectations that this device wouldn't let us down in

The 2,000mAh battery stood up well to its peers.



the power stakes. In our standard video rundown test, with the display set at 50 percent and WiFi on, the E2 lasted six hours and 51 minutes. That puts it ahead of heavy-hitters like the Galaxy S4 Active (6:13), HTC One (6:30) and just behind the Droid 4 (7:15) and the similarly low-priced Nexus 4 (5:18).

While out and about, we found that the E2 managed about half a day of reasonably constant use before we felt compelled to reach for the micro-USB cable.

For the minority of you who still use your smartphone as, you know, a phone, you'll be interested to hear about the E2's call quality. Unfortunately, we found that the audio was severely muffled and scratchy, and when we reached to turn the volume

up, we were dismayed to see that it was already maxed out. Testing this unit's prowess with mobile data, we were able to pull 7.49 Mbps down and 1.45 Mbps up on Three UK's HSPA+ network out here in the sticks.

THE COMPETITION

While Acer is pricing the E2 at £180, Three has announced a pay as you go price of £150, and an on-contract cost of £17. For that sum of cash, you can buy a Lumia 620 running Windows Phone 8, while an extra £10 will get you either Samsung's Galaxy Ace 2 or LG's Optimus L5 II. How much more would it cost for you to get out of the smartphone equivalent of the bush league? About £60.

The Liquid E2 fits the bill for basics and necessities.



Yes, *we know*, if you're looking at this phone, you might not have that sort of cash to spare, but if you do, then you can grab the Nexus 4. It won't shock you to know that the Nexus 4, another 3G-only phone, has a fantastic camera. It's also a Nexus device, of course, so you won't need to wait around for your phone maker to start supporting the latest build of Android. And, perhaps most importantly, it delivers flagship-caliber performance for around half the price you'd expect to pay.

WRAP-UP

We opened by saying that budget handsets require reviewers to dial down their expectations, taking the low price into consideration and seeing if it softens what might otherwise be serious objections. In that regard, we run the risk of either damning the device with faint praise or, equally,

giving a free pass to some of its more egregious flaws. When it comes to Acer's Liquid E2, we feel that it's utterly unspectacular in every way, but given the target market, that isn't necessarily a bad thing.

If you're looking for top-notch performance, a better camera or a productivity powerhouse, then this handset won't be for you. If, however, all you need is an affordable phone that can check the news, tweet and take the odd unimportant snap, then this is a perfectly acceptable option with decent battery life, to boot. Just remember to ensure your expectations are suitably lowered before taking the plunge. For everyone else? Walk toward the Nexus 4 and don't look back. **D**

Dan is a man of many words, most of which are foisted upon his unsuspecting audience on Twitter.

BOTTOMLINE

ACER LIQUID E2

£150
(\$232
APPROX.)



PROS

- Inexpensive
- Stock Android
- Sturdy build
- Decent battery life

CONS

- Subpar camera
- Poor sound, weak call quality
- Mediocre performance

BOTTOMLINE

The Liquid E2 is a decent handset for casual users, offering good battery life and stock Android. Just make sure you've lowered your expectations before taking the plunge.



DIGITAL STORM VELOCE



The Clevo-made **Digital Storm Veloce** packs quite a punch, but it may not be the total gaming package
By Sean Buckley

In a market obsessed with slim, lightweight, energy-efficient machines, gaming laptops stick out like a sore thumb. Hulking 17- and 18-inch chassis dominate the category like a physical representation of a tired cliché: bigger is better. In some ways, the old phrase rings true — these oversized machines often pack the latest and greatest components — but any hope of reasonable portability is lost in the mass.

Despite this overwhelming (and oversized) majority, a handful of small-frame rigs still make it to market each year, and one of 2013's most petite



just happens to have landed on our reviews desk. Meet the Clevo W230ST, a 13-inch, ODM (original device manufacturer) gaming notebook destined to be rebadged under different brands. As such, it goes by many names — Sager, Origin PC and AVADirect each have their own take — but today, we're looking at Digital Storm's version, the Veloce. Can this diminutive monster keep up with the category's biggest beasts? Let's find out.

LOOK AND FEEL

As an ODM reseller, Digital Storm faces an interesting challenge: it has to find a way to make its version of the Clevo W230ST stand out against what its competitors are selling. Their angle? Free T-shirts. Digital Storm includes a tee with every order, packing it neatly away into the laptop's accessory box alongside a black binder. Normally we wouldn't fawn over office supplies, but the three-ring file is actually a welcome courtesy, as it neatly organizes the laptop's various documents into a single clean volume. Groundbreaking it's not, but it is reassuring to thumb through these pages to find a signed certificate of ownership, troubleshooting tips, warranty information, a pair of driver



For the most part, the Veloce is a stock Clevo shell.

reinstallation discs and a complete checklist of the tests run on the laptop before it was shipped out. If nothing else, the presentation ensures that even the messiest gamers will be able to keep their computer's documents in order.

The company left less of a personal touch on the hardware itself: save for a Digital Storm logo on the back of the soft, rubberized lid, Clevo's stock chassis is presented without decoration. The housing itself is fairly modest, with the corners trimmed off at shallow angles. It's a safe design, offering just enough disruption to please gamers, while still being discreet enough to pass for a work machine. At 12.99 x 8.93 inches, it'll fit in a modestly sized backpack or messenger bag. It's not the thinnest gaming laptop in its class (that honor goes to the 14-inch Razer Blade), but it makes fair use of its 1.25-inch edges: running down the right side are



three USB 3.0 ports, HDMI and VGA out sockets, an Ethernet jack and the all-important charging connector. The rest of the machine is relatively bare: the front harbors only an SD / MMC reader and a quartet of LEDs, while the left is home to a pair of audio ports and a single USB 2.0 plug. Simple.

KEYBOARD AND TRACKPAD

Perhaps we're spoiled by the class-leading keyboards of the Razer Blade and MSI GT70, but as soon as we laid hands on the Veloce, something just felt *off*. Lurking under the keycaps' spacious layout and illuminating backlight lies the soul of a stiff, awkward keyboard. The keys provide strong tactile feedback with each

click, but every stroke lands hard, met by heavy resistance. This is highly subjective, of course, but this sort of thing matters to those who plan to use the laptop as an all-purpose machine. As a typewriter, the Veloce just feels a bit rougher than it needs to be. On the other hand, we found the lack of key-bounce to be much less distracting during gameplay; the keyboard's rigid panel somehow felt more appropriate in the heat of battle. The overall layout seems well suited for gaming too, as it naturally puts your fingers near the Alt, Shift and Ctrl keys in WASD control settings.

Like most laptops, the keyboard uses an array of Fn combinations to toggle common

The keyboard isn't as comfy as its closest competition.

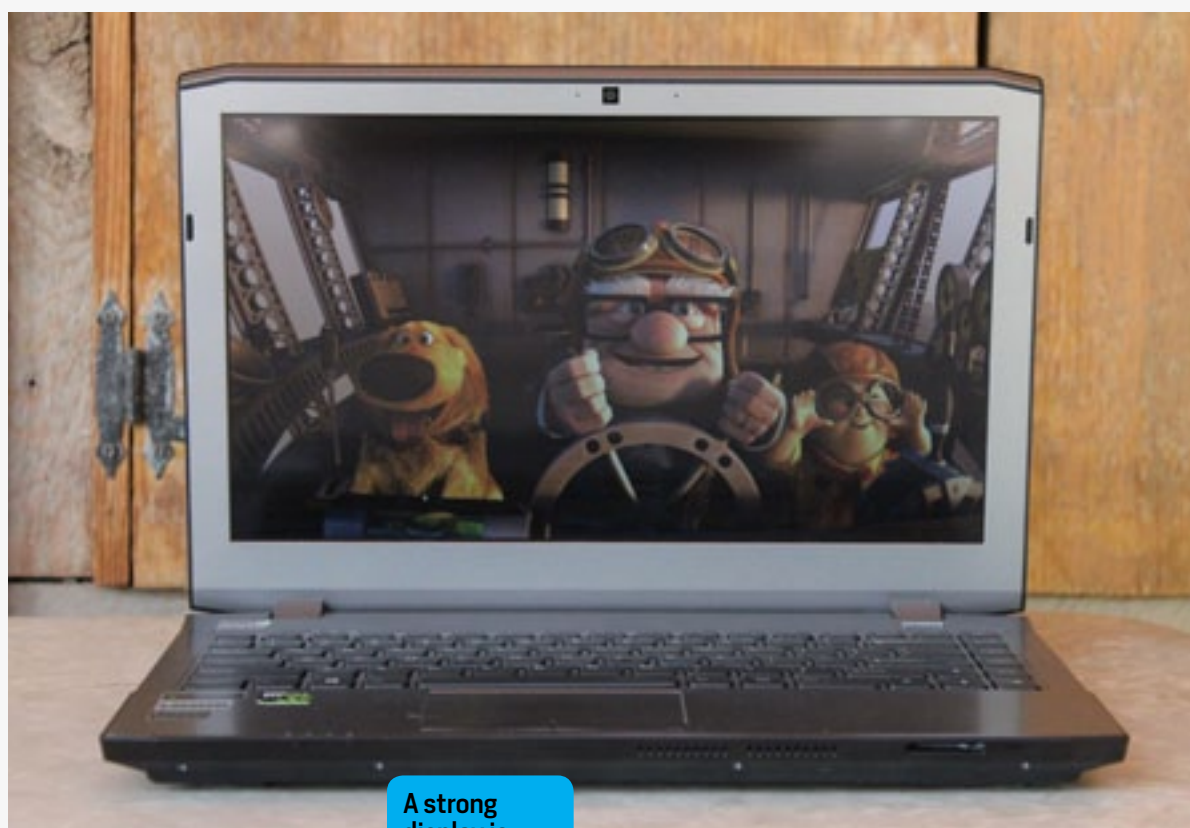


functions, but one vital switch seems to be missing: the Windows key disable. The layout does its best to reduce the chances of accidental Windows-key hits, but we still found ourselves dropping out of the occasional game due to slippage. A disable hotkey is pretty standard in most gaming rigs today, and we certainly missed it here.

We were pleased to find the Veloce's trackpad responsive, accurate and completely capable of handling Windows 8 gestures — something we're always happy to see in the PC category. Two-finger scrolling, pinch-to-zoom and image rotation all worked like a charm. The mouse's only real fault is its size, a sad consequence of the machine's petite frame. We blame the laptop's low-hanging keyboard: if the keys were only an inch farther north, the trackpad might have had enough room to offer a comfortable navigation experience.

DISPLAY AND SOUND

Lifting the lid reveals one of the Veloce's best features — a 13.3-inch, matte IPS panel (non-touch) with wide viewing angles, brilliant colors and a 350-nit LED backlight. It's like the cherry on top of a sundae: a solid



A strong display is hampered by backlight bleed-out.

gaming machine just isn't complete without a strong viewing experience. We may not have always opted for the maximum 1,920 x 1,080 resolution while working in the desktop, but we welcomed the added workspace nonetheless, especially on a smaller screen like this. Sadly, the display's luminous backlight bleeds out from under the panel's frame. The effect isn't noticeable unless the monitor's image is almost completely dark, but it's still a slight letdown on an otherwise fantastic display.

Unfortunately, we can't offer the same praise to the laptop's speakers: the stereo drivers here are thoroughly disappointing. Hidden underneath the laptop's tapered edge, the stereo speakers produce muted, tinny audio with little to no bass. They'll get you through the occasional YouTube video and casual game session, of course, but it's



ultimately a flat experience. Naturally, a dedicated gaming headset will outperform almost any laptop speaker setup, but the Veloce's audio offering will probably be trumped by *anything* with a 3.5mm headphone jack. Accessorize and carry on.

PERFORMANCE AND BATTERY LIFE

Don't let the Veloce's diminutive footprint fool you: this 13-inch notebook is built on the same top-notch technologies as its super-sized competition: the dynamic duo of Haswell and Kepler. Under the hood, there's a 2.7GHz, quad-core Intel Core i7-4800MQ CPU, 8GB of RAM and a 2GB NVIDIA GeForce GTX 765M graphics processor. If what's inside is what counts, the Veloce has it.

Although the usual gamut of benchmark tests place the Veloce on par with the refreshed Razer Blade, these sterile numbers ignore an important detail: resolution. The screen's native 1,920 x 1,080 pixel count is both an asset and a handicap; the system offers full HD gameplay at the expense of performance. Take *BioShock Infinite*, for example: tuned to match the Blade's 1,600 x 900 resolution and dialed into Ultra High Quality, the Veloce equals its competitor's performance blow for blow, rendering at a steady 35 frames per second. Upping the resolution to the panel's native view, however, knocks a full 10 points off of its performance, requiring you to reel in the graphic settings to achieve a fluid frame

rate. This isn't a bad thing, of course, it just means you have the burden of choice: higher resolution, or more extreme visual settings?

In our experience, games typically look their best when drawn at the monitor's native size — this saw us tuning most of our games just a tick below their maximum settings. *Grand Theft Auto IV* and *BioShock Infinite* both ran like butter on their standard high-quality settings, each averaging 50 frames per second at 1,920 x 1,080. A similarly configured *Battlefield 3* clocked a respectable average of 47 fps on large-scale conquest maps, but could handle ultra-high-quality specifications in smaller arenas. We weren't surprised to see *Far Cry 3* and *Crysis 3* stutter at higher settings, but both were playable (and still quite fetching) when tuned to medium and low configurations, respectively. We were able to get both games running on ultra settings by knocking down the resolution, of course, as we could with any of the above titles. Some games didn't require any concessions at all: *The Elder Scrolls V: Skyrim* happily chugged along at 45 to 75 fps on ultra-high quality, depending on whether the character was indoors or outdoors. This is when that 1080p screen makes a difference; it's always good to know you can dial down to a lower resolution if you *have* to, but it's a thing of beauty when you don't.

As much as we'd like it to be, Has-



BENCHMARK	PCMARK7	PCMARK VANTAGE	3DMARK06	3DMARK11	ATTO (TOP DISK SPEEDS)	BATTERY LIFE
DIGITAL STORM VELOCE (2.7GHZ CORE i7-4800MQ, GEFORCE GTX 765M 2GB)	6,107	21,379	20,340	E6,696 / P4,353	506 MB/S (READS); 196 MB/S (WRITES)	2:53
RAZER BLADE 14-INCH (2.2GHZ CORE i7-4702HQ, GEFORCE GTX 765M)	5,837	19,505	19,815	E6,364 / P4,161	546 MB/S (READS); 253 MB/S (WRITES)	6:24
MSI GT70 DRAGON EDITION (2013) (2.4GHZ CORE i7-4700MQ, GEFORCE GTX 780M)	6,111	20,250	N/A	E10,519 / P7,416	1.19 GB/S (READS); 806 MB/S (WRITES)	4:34
RAZER BLADE 2.0 (2.20GHZ CORE i7-3632QM, GEFORCE GTX 660M)	N/A	17,120	15,876	N/A	N/A	3:29
RAZER EDGE PRO (1.9GHZ CORE i7-3517U, NVIDIA GT 640M LE 2GB)	4,949	13,536	10,260	E2,507 / P1,576	409 MB/S (READS); 496 MB/S (WRITES)	3:40
SAMSUNG SERIES 7 GAMER (2.30GHZ CORE i7-3610QM, GEFORCE GTX 675M)	N/A	11,515	21,131	N/A	N/A	2:11

well isn't always a magic talisman of battery endurance. Engadget's standard rundown test (in which we loop a locally stored video at a fixed brightness with WiFi on) depleted the ma-

chine's battery in just under three hours — not a terrible runtime for a gaming laptop, but disappointing compared to the competition (see the table for a more detailed comparison).



SOFTWARE

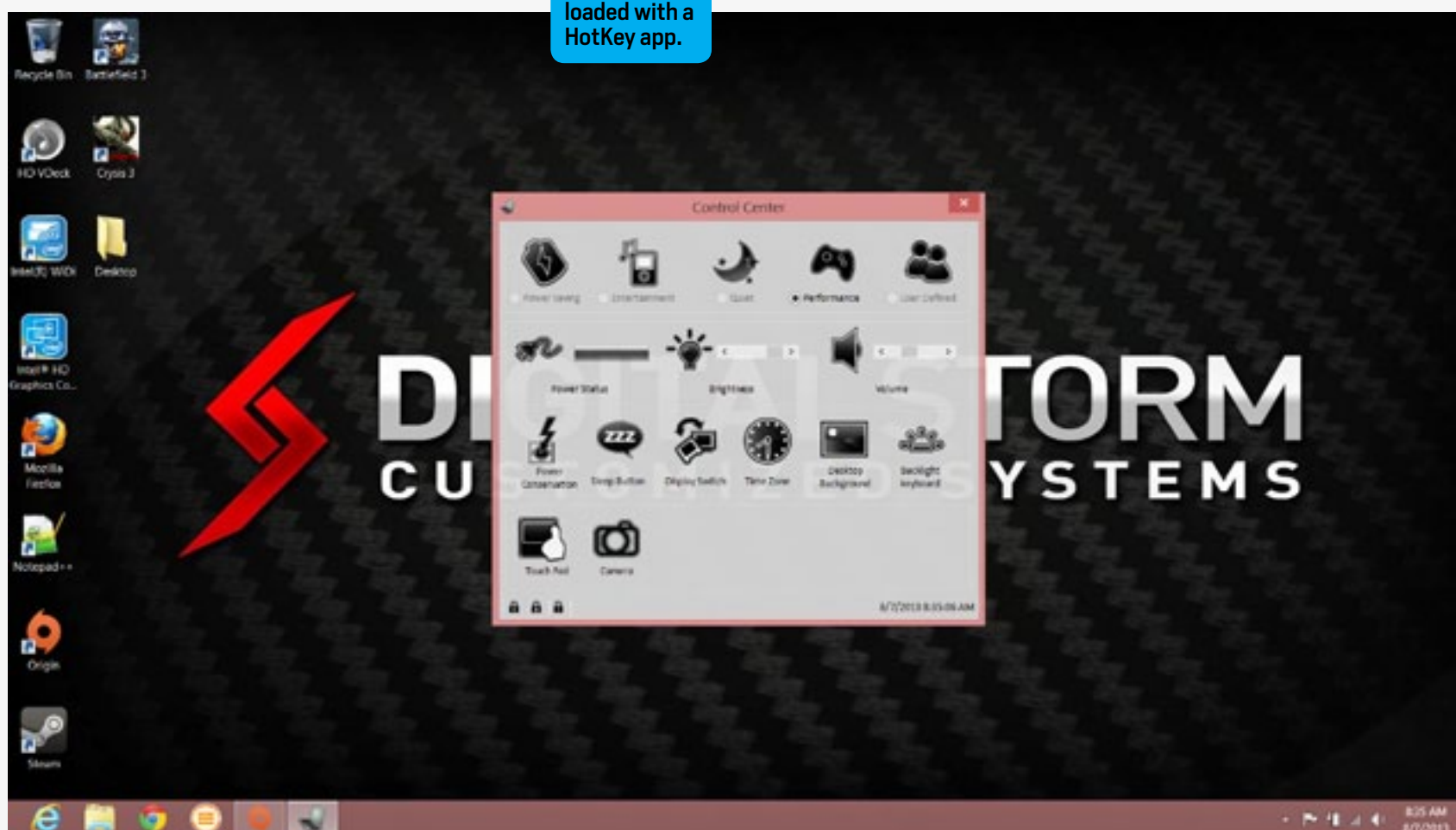
Digital Storm prides itself on providing users with vanilla Windows installations, and that's almost exactly what we have here on our review unit. There's *one* included program of note, however: an application identified only as "Hot-Key." Technically, HotKey is a quick-key control center provided by Clevo with the Veloce's default drivers. All told, it offers shortcuts to the laptop's power settings, brightness control and keyboard backlight toggles. More notably, it allows you to select between three different "power conservation" modes: Performance, Balanced and Energy Star. While we didn't notice a marked improvement in battery life by switching to Energy Star, we found gameplay often stuttered if we weren't set to Performance mode,

and that's even when the power profile was already tuned for gameplay.

CONFIGURATION OPTIONS AND THE COMPETITION

The Veloce is available in four distinct configurations, simply named "Good," "Better," "Best" and "Ultimate." Our \$1,596 review unit falls into the "Better" category with a 2.7GHz Intel Core i7-4800MQ CPU, NVIDIA's GTX 765M (2GB), 8GB of DDR3 RAM, a 128GB SSD and a secondary 750GB hard drive for file storage. Upgrading to either "Best" or "Ultimate" means doubling the machine's RAM and stepping up to an Intel Core i7-4900MQ CPU. Those cost \$1,998 and \$2,180, respectively, with storage being the main difference: the "Best" model has 180GB of storage, whereas the "Ultimate" version has a

Near-stock Windows comes pre-loaded with a HotKey app.



The Veloce's design flaws reduce it to what is ultimately a very average gaming laptop.

240GB SSD. A budget model eschews solid-state storage completely, offering a 500GB HDD, 8GB of RAM and a Core i7-4700MQ CPU for \$1,284. And if none of those configurations tickle your fancy, each model can be customized with a half-dozen storage options and any of the other components we mentioned.

Let's not forget, how-

A collection of requisite ports lines the right side of the Veloce.

ever, that the Veloce is an ODM laptop made by Clevo; Digital Storm isn't its only distributor. Sager's baseline variant, the NP7330, starts at \$1,149, and the cheapest configuration of Origin PC's EON-13 goes for \$1,474. An unbranded version of the machine can be purchased from AVADirect, if neither of those banners suits your mood. In that case, a rig matching our review unit would ring in at \$1385.14.

Buyers put off by the Clevo's short battery life might want to take a look at Razer's 14-inch Blade. Yes, \$1,800 is a lot to ask for a machine with only 128GB of storage, but it's hard to argue with more than six hours of battery life in a gaming laptop. Plus, its build





Flaws in execution keep the Veloce from top billing.

quality is top-notch, assuming you can cope with a lower-res (and less vibrant) display. If your wallet is tight, Dell's Alienware 14 is a much closer match: it starts at \$1,200 and can be configured to match or even undercut the Veloce. Of note: the Alienware chassis is a little thicker than Clevo's offering, but again, it at least has the credibility of a major brand.

WRAP-UP

Despite its triumphs in performance, the Veloce's design flaws reduce it to what is ultimately a very average gaming laptop. It's built from excellent components, but it's weighed down by a host of nagging issues. On their own, the machine's middling sound, leaking backlight, stiff keyboard and short battery life could've been shrugged off, but together,

these compromises are much harder to ignore. That said, it's still an affordable and extremely portable gaming machine, and a worthwhile option for mobile gamers on a budget. And hey — who can argue with a free T-shirt? **D**

Sean a lifelong gamer, a comic-book nerd, and an Eagle Boy Scout. He also writes for Engadget. What else is there to know?

BOTTOMLINE

DIGITAL STORM VELOCE

\$1,284+



PROS

- Brilliant 1,920 x 1,080 display
- Fast, powerful
- Portable design

CONS

- Stiff keyboard
- Some build quality issues
- Battery life short compared to the competition
- Disappointing audio

BOTTOMLINE

The Clevo-based Veloce is a powerful, affordable gaming portable, but weak speakers, a bleeding backlight and short battery life keep it from being a home run.



TOSHIBA EXCITE WRITE



The **Excite Write** comes equipped with a Wacom-powered stylus, but does it handle enough heavy lifting to justify the price tag?
By Joseph Volpe

It's a tricky thing to name your devices after a verb. And when we say “tricky,” we mean ill-advised. That Toshiba could willfully overlook Excite as a magnet for terrible (and terribly negative) puns speaks to its distance from the tablet category (remember the Thrive?). Yet, here we have another generation of Excite tablets and this, the Excite Write, is the line's top-shelf offering. Its Wacom digitizer and included stylus mean this tablet can go toe to toe with the Note 10.1; both have the same screen size and 1,024 degrees of pressure sensitivity. But where



Samsung's outsized Note skimmed on the HD resolution, Toshiba's gone the opposite direction. Boasting a 2,560 x 1,600 display, a Wacom digitizer, a Tegra 4 heart, 2GB of RAM and Harman Kardon speakers, the Write is a welcome chord change in an otherwise uneventful 10-inch Android fugue. Of course, the catch to all of this premium goodness is a premium price: \$600 in this case. You still there?

HARDWARE

Sony and Apple have made a real commitment to industrial design — just read any recent review of either company's mobile products and you'll find effusive praise. The same can't be said for Toshiba. The company isn't really on US consumers' radar, especially people shopping for tablets. You'd think, then, that to attract eyeballs and wallets, Toshiba would go for the glitz. But it hasn't. The Excite Write (we cringe with every typed utterance) comes wrapped in a textured plastic shell. Its color is silvery gray and, though we're not the type to use and abuse our products, that paint job looks like it'll chip off or scratch easily, but so far it's held up well. The backplate also feels somewhat hollow, as if there's emp-

ty space beneath it. Tapping on its center will corroborate this assumption.

The Excite Write's rear 8-megapixel camera is located off to the upper-right corner and is smartly recessed, shielding it from scratches when the tablet is lying face-down. To its right is an accompanying LED flash. Other than that, Toshiba's branding, the FCC label, Harman Kardon logo and speakers are all splayed across the bottom. The choice of speaker placement is woefully at odds with how users will naturally grip the tablet. They're situated at the exact point where your palms will hold the backplate and, consequently, suffocate sound. Again, this is glaring evidence of Toshiba's lack of design finesse. Tablets are no longer a new and untested product category; common sense dictates a different speaker arrangement.

All three of the Excite Write's ports (microSD,

Harman Kardon-powered speakers sit on the back.



mini-HDMI and micro-USB) are housed beneath a loosely secured flap that's tenuously connected to the frame. Carelessness or a slight mishandling could cause it to break off all too easily. Flanking either side of this are the DC charging port below and, near the top-left edge, a volume rocker and 3.5mm headphone jack. The uppermost edge of the device is reserved for the power button and nothing else.

Its front face looks much the same as most other 10-inch tablets. There's a generous bezel all around the screen, a 1.2-megapixel front-facing camera module up top and branding for Toshiba and Harman Kardon below. The Excite Write's edges are smooth and rounded, so your palms won't hurt from holding it — in fact, its 0.4-inch (10.1mm) thickness means there's plenty to hold, but its 1.48-pound weight (671.3 grams) will eventually tire you out.

We need to talk about the Excite Write's screen. In theory, its 10-inch, 2,560 x 1,600 IPS display should sear away our retinas with its splendor, but actually, the opposite happens. Oh, you won't find fault with its clarity and crispness; the pixel density here (300 ppi) is plain fantastic. So much so, that we were even able to notice a difference in Amazon's app icons — the Amazon MP3 app shortcut appears blurrier, as it wasn't optimized to be viewed on a screen this sharp. No, our beef has to do with the panel Toshiba employed, something it calls a PixelPure display. What-

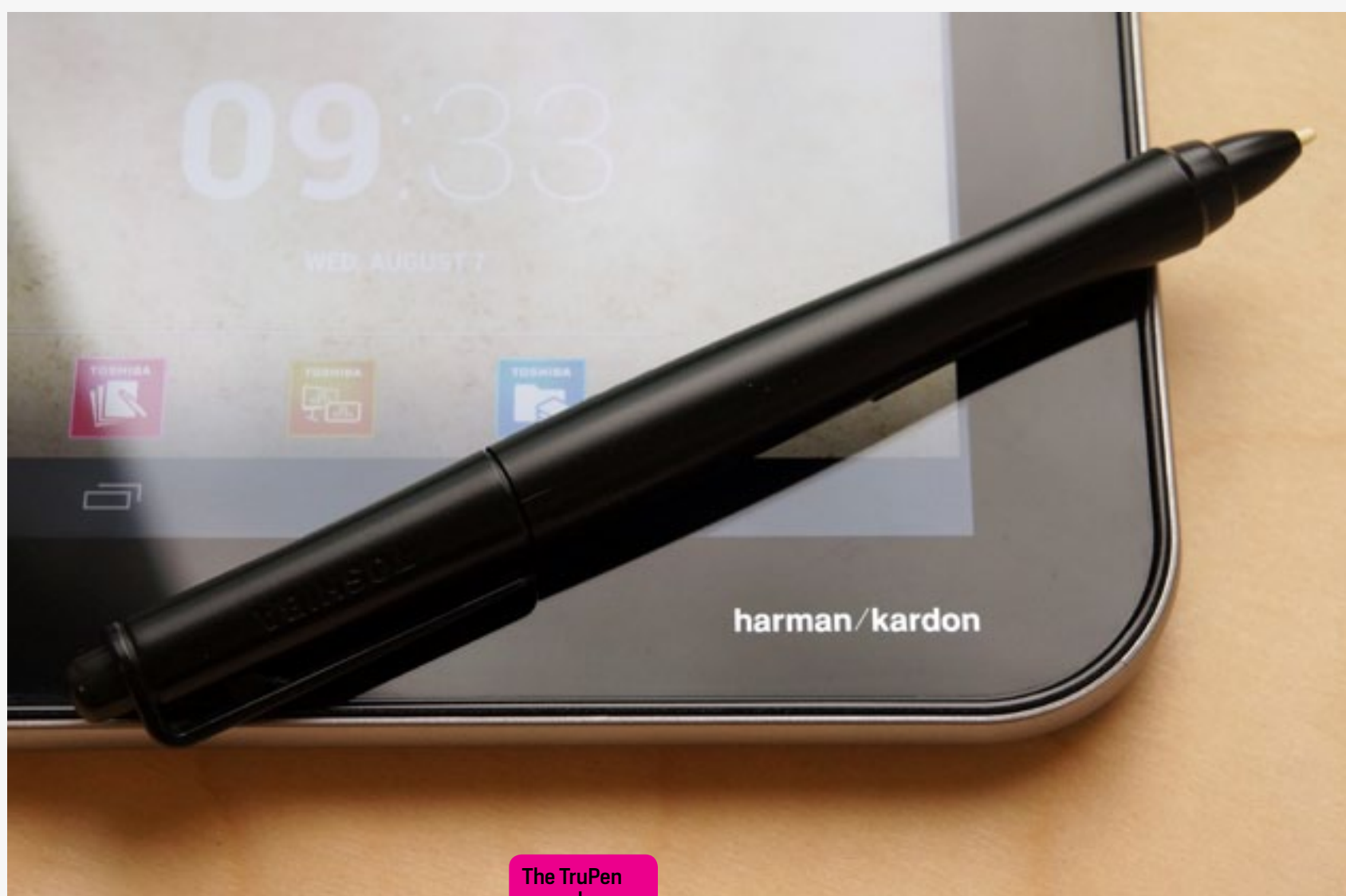
ever snazzy marketing name Toshiba's slapped on it, its colors lack the pizzazz we expect from something so high-res. Take the Google Chrome logo, for example: the yellow has a muted, brownish hue. Further, whites, like on the Gmail or Play Store icons, appear somewhat grayish. It's disappointing, but not a dealbreaker by any means.

TRUPEN

If it was a Note 10.1 clone Toshiba intended to create, it didn't entirely succeed. The tablet incorporates a Wacom digitizer that, when used in conjunction with the pack-in stylus (sorry — *TruPen*), mimics handwriting excellently. Users are presented with two options to enjoy this feature: Stylus Mobile or TruNote. Stylus Mobile appears as a separate app within the Excite Write's drawer, but it's really just an input option. Setup for this is not user-friendly. In fact, we stumbled upon it by chance days after using the tablet.

TruPen input can be enabled either from within the app itself, from settings or even by long-pressing on the space bar when in a text-based app. When a user selects it as the primary source of input, options will be displayed for text size, color and ink thickness, as well as scrolling speed and the baseline position for the handwriting recognition box. There is a tutorial, but it's not automatic and users will have to seek it out to make the most of Stylus Mobile. Unsurprisingly, many of the gesture





The TruPen wrangles handwriting, but lags a bit at times.

commands employed by the likes of Samsung's Note line are used here, too. Strikethroughs or cross-outs will delete a word or portion of it; a curved underscore will join word fragments together; while a straight line drawn down between letters will add a space. Users can even overwrite on a word to correct misspellings. The TruPen can also be flipped around and used like an eraser — the tablet will automatically recognize this — or switch pen styles via hard key.

In practice, my finely honed cursive (which is more like illegible shorthand) appeared on screen with little lag and, more often than not, was correctly recognized when translated into text. It's

not the most efficient option for banging out an email, but for users that want to rely on the TruPen, it's at least reliable. Resting your palm on the tablet while you write is thankfully not an issue. I leaned my hand heavily on the Excite Write and still it carried on relaying our scrawl unhindered. There's even an option, buried in the settings menu, to enable a hovering pointer and calibrate alignment. But, regardless of how well it works, the Excite Write's stylus-oriented software suite just isn't as robust or compelling in its gimmickry. And by that I mean, there's just one TruPen app: TruNote.

TruNote is a barebones imitation of Samsung's S Note and S Memo, and



its interface is utterly baffling. TruNote's UI is bereft of any indication of what onscreen options are available — there's no helpful captioning to guide users, just a haphazard arrangement of notebooks, the most recently taken screenshot and a pen that does nothing. Tap on any of the assorted books and you'll be taken through a two-step process that leads to the actual editing page. There, only three pen color options are on offer, plus eraser and crop tools. Or so it would seem. Long-press on any of the pen options and a window will appear allowing you to specify pen type, color (10, in all), thickness and transparency. Jump out of the note and you'll be afforded the ability to add a label or pages, view properties or page lists, edit, search or delete. Like we said, it's pretty basic stuff. You won't find templates here or the ability to share what you've created.

CAMERA

The Excite Write's camera is a mixed bag of pleasing performance and confusing implementation. The UI, at first glance, appears to have zero options — just soft keys for camera, video, panorama, shutter and flash. Again, it was

only by accident that we discovered the fuller settings wheel, accessible by holding your finger to the screen. At that point, a wheel will surround your finger with options to set the exposure, white balance, HDR, scenes modes, flash and switch cameras. It's neat to look at, but we would've preferred a more traditional arrangement. This is just not that user-friendly.

Focus can be set by touching anywhere on the screen, but once this locks, it doesn't follow up with a shutter snap. You still have to manually tap the shutter key for capture. As for the photos it produces, generally we came away with decent shots. Oddly, though, colors seem to be slightly overexposed and also artificially enhanced. Detail also seems to drop off outside of the focal point and zoomed-in images are mostly unusable

Camera shots are decent despite the hidden UI.



due to excessive noise.

The Excite Write's 1080p video recording is pretty solid. The frame rate in our sample held up well and the noise-canceling powers of the Excite Write are strong enough to block out the ambient noise of downtown New York City; it sounds like we recorded it in a vacuum.

PERFORMANCE

Tuck in for another uncomfortable revelation: the Tegra 4 chip here is not used to good effect. It's almost as if the Excite Write is suffering from a pervasive performance hiccup — nothing works as smoothly as it should despite our enabling Tegra 4 optimization. Perhaps it's just the Tegra 4 that's taking time to cycle back up to a productive state, but even so, never once were we

treated to a brisk experience, as we were on the NVIDIA Shield. Animations here have the distinct sensation of chugging along; app launches take far too long — even accessing the app drawer; the most basic of tasks are slow and inelegant.

It almost goes without saying that tablets are a lean-back experience. We use them primarily when we're sitting on our couches, as receptacles for our splintered attention spans. While that means the tablet is typically a second screen, it can also sometimes be the sole option for streaming media, like Netflix. The Excite Write's full HD screen makes for a great viewing experience and with an audio company like Harman Kardon on board, you'd think the sound would be ace too. (Cue the sad trombone.) Maximum volume output is just too low

BENCHMARK	TOSHIBA EXCITE WRITE	NEXUS 10	SAMSUNG GALAXY TAB 3 10.1	SONY XPERIA TABLET Z
QUADRANT (V2)	12,272	4,551	6,564	7,434
VELLAMO (V2.0 HTML5)	2,362	1,605	1,694	2,242
ANTUTU	26,696	8,731	22,042	20,263
SUNSPIDER 0.9.1 (MS)	851	1,371	1,399	1,382
GLBENCHMARK 2.5 EGYPT 1080P OFFSCREEN (FPS)	N/A (WOULDN'T RUN)	33	N/A (WOULDN'T RUN)	32
CF-BENCH	28,330	9,772	6,329	17,790
BATTERY LIFE (RUNDOWN TEST)	8:13	7:26	6:55	8:40

SUNSPIDER: LOWER SCORES ARE BETTER



to be sufficiently audible in a moderately noisy environment, although it works fine if you're in quiet surroundings. Additionally, and as we mentioned previously, there's just no way around *not* covering the dual speakers with your palms. And even if you do manage to avoid muffling the sound, it's still being directed away from you because of the speaker placement.

Standardized benchmark testing proved to be a clean sweep for the Excite Write and its Tegra 4 processor. Pitted against the Nexus 10, which features a similarly high-res display; the Xperia Tablet Z, with its 1080p resolution; and the comparatively lesser Galaxy Tab 3 10.1, Toshiba's tablet is the clear winner in raw performance. That's not something we've seen spill over into real-world usage, but with the recent news that manufacturers are gaming benchmark results, we're not giving much weight to these numbers.

BATTERY LIFE

Don't expect to get a spectacular run out of the Excite Write's 4,380mAh battery. After six days of casual use, including light browsing and tweeting, battery life remained at 60 percent. Thereafter, though, as we ramped up our usage, especially by watching video, that number plummeted to 28 percent in a matter of hours. WiFi and the display itself are the two most energy-hungry culprits, so if you actively manage brightness and toggle WiFi on only when needed, you'll be

TABLET	BATTERY LIFE
TOSHIBA EXCITE WRITE	8:13
APPLE IPAD MINI	12:43 (WIFI)
APPLE IPAD (LATE 2012)	11:08 (WIFI)
APPLE IPAD 2	10:26
ASUS EEE PAD TRANSFORMER PRIME	10:17
APPLE IPAD (2012)	9:52 (HSPA) / 9:37 (LTE)
NEXUS 7 (2012)	9:49
MICROSOFT SURFACE FOR WINDOWS RT	9:36
APPLE IPAD	9:33
ASUS TRANSFORMER PRIME INFINITY TF700	9:25
SAMSUNG GALAXY TAB 2 10.1	8:56
SONY XPERIA TABLET Z	8:40
HISENSE SERO 7 PRO	8:28
LENOVO IDEATAB S2110	8:07
GALAXY TAB 2 7.0	7:38
HP SLATE 7	7:36
NEXUS 10	7:26
SAMSUNG GALAXY NOTE 8.0	7:18
NEXUS 7 (2013)	7:15
RIM BLACKBERRY PLAYBOOK	7:01
SAMSUNG GALAXY TAB 3 10.1	6:55



able to significantly extend performance. We should also note there are three power-management options available within settings: default, power save and custom. Our tablet is currently set to the default. Formalized testing puts the Excite Write's 4,380mAh cell at eight hours and 13 minutes — that's with brightness at half, Twitter syncing every 15 minutes, WiFi / GPS enabled and one push email account active. That's three hours less than the current 9.7-inch iPad, but still significantly better than the new Samsung Galaxy Tab 3.

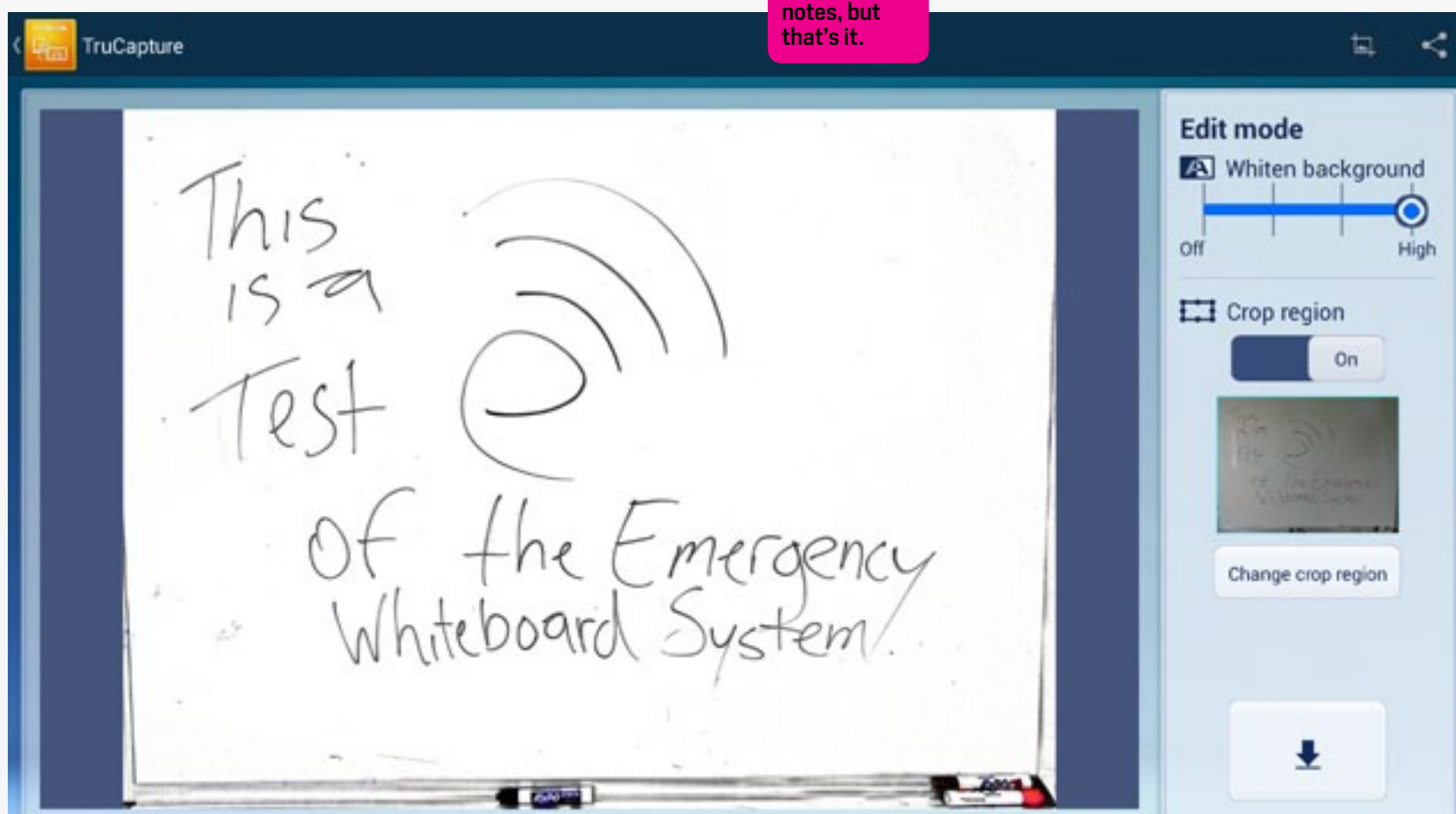
SOFTWARE

Unblemished Android Jelly Bean — that's what you'll get when you fire up the Excite Write. That is to say, there's no UX overlay, so Android purists, this is your cue to rejoice. Just to be clear, Toshiba

has made some tweaks; you can see this in the arrangement of the home screen (a screenshot shortcut is included on the navigation bar) and the Power Management, Image Stabilization and 3D output options available from within settings. Otherwise, though, it's Android 4.2.1 as you've always known and preferred it. Kudos to Toshiba on that front.

Unfortunately, Toshiba didn't exercise the same restraint when it came to the app bloat. Sure, there are some useful, major third-party apps pre-loaded, like Hulu Plus, Amazon Kindle and Evernote / Skitch, but the rest — GApps, excluded — are just filler. Six games are pre-installed on the device, in addition to the likes of Amazon Shopping, Amazon MP3, Adobe Reader, App Place, Book Place, Crackle, eBay, Toshiba File

TruCapture grabs white boards and notes, but that's it.



Manager, iHeartRadio, Toshiba Media Player, News Place, PrintHand, Rdio, Toshiba Service Station, Stylus Mobile, Tablet Security, ThinkFree, TruCapture, TruNote and Zinio. And not all of these can be uninstalled — mostly just disabled — which eats into your allotted 32GB of internal storage.

Of Toshiba's own apps, TruCapture is a curious addition. Its sole purpose is to snap photos from notebooks or dry-erase boards and then render the most legible image. It's a fairly straightforward process, though the initial tutorial page is so crammed with instructions as to be off-putting. The process works like this: launch the app, choose whether or not to

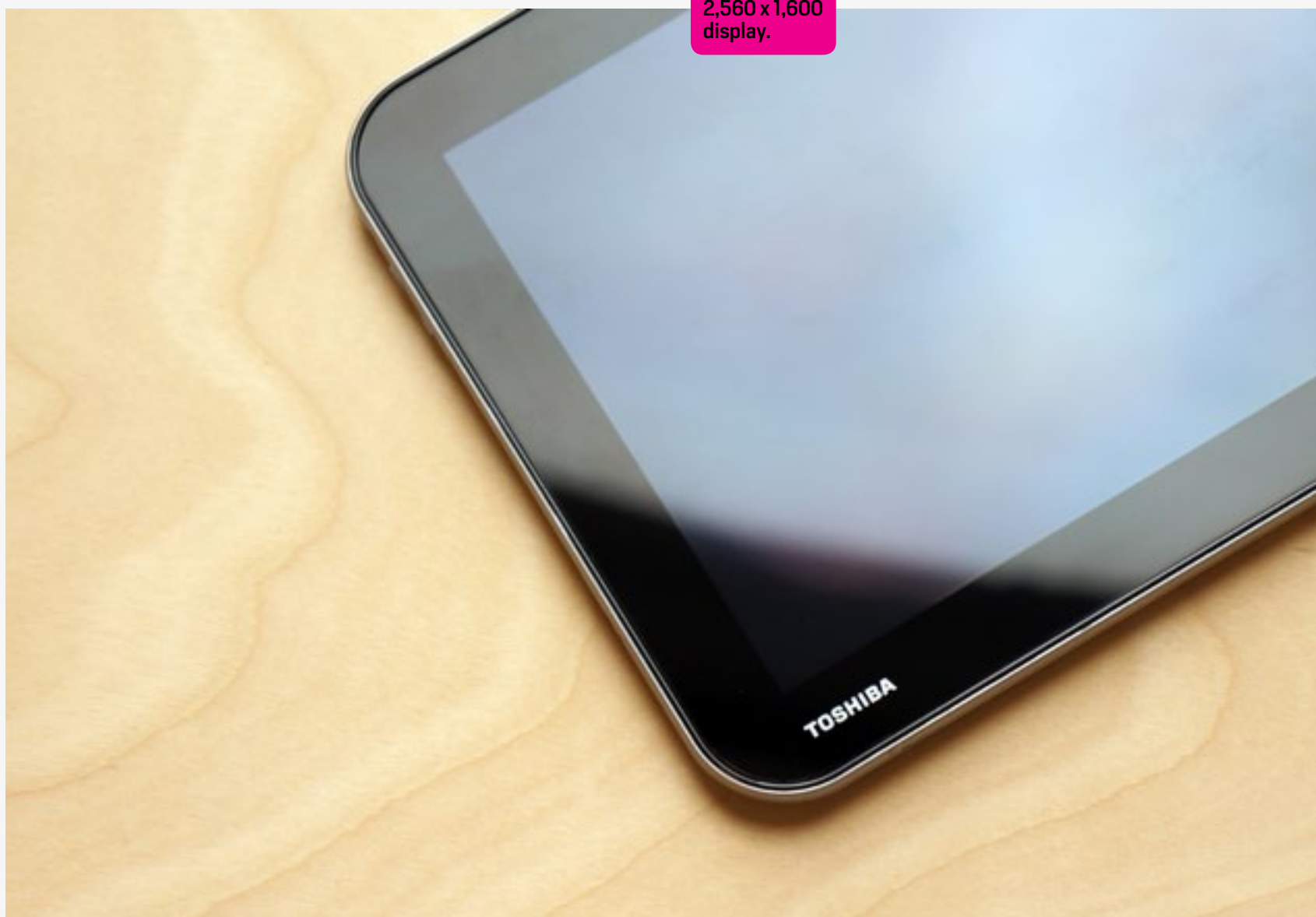
enable Reflection Reduction (which does what it says and requires two separate photos for image processing), snap your pic and then crop or enhance the background whiteness as you please. It's probably a useful tool if you're in boardrooms all day, but most anyone else using this tablet will skip right past it.

THE COMPETITION

So what if you like the idea of a high-resolution display, but you're not entirely sold on the Excite Write's execution? Lucky you, there are alternatives, but all come with specific trade-offs.

Of the bunch, only Apple's 9.7-inch iPad matches the

This is one of the few slates with a 2,560 x 1,600 display.



Excite Write in price and storage, but, take note, its 2,048 x 1,536 screen, which works out to 264 ppi, is comparatively less pixel-dense than Toshiba's 300-ppi panel. Or you can go the Android route and opt for Google's Nexus 10 for \$499 — already a cheaper option. That'll get you access to the latest Android updates, 32GB of storage and a 10-inch, 2,560 x 1,600 screen to rival the Excite Write. If you're willing to sacrifice the super-sharp display for a more stylus-oriented experience, it might be worth considering Samsung's Galaxy Note 10.1 for \$499. Again, its 10.1-inch, 1,280 x 800 display won't wow, but the tablet's at least made with the S Pen in mind and, for the lesser price, you're getting the same storage.

WRAP-UP

On paper, the Excite Write comes off like a premium product loaded up with top-shelf specs that more than merit

the \$600 price tag. How it fares when it's actually in hand, however, is another matter. Turns out, Toshiba's asking price is more of a warning sign than a high-end designation. The Tegra 4 chip inside should provide a blisteringly fast experience, but the reality is the opposite; it's faltering, if anything. The Excite Write's TruPen features should help it to stand out and even best Samsung's own pioneering Note products, but again it fails to hit the mark. TruPen applications are sparse — there's just the one — and there's no place to actually stow the stylus on the device. Meaning, you'll lose it pretty easily. Even the 2,560 x 1,600 PixelPure display is a letdown, with colors that muddy rather than shine. And all this can be yours for \$600? We think not. **D**

Joseph Volpe is ambiguously ethnic. He is also a Senior Associate Editor at Engadget.

BOTTOMLINE

TOSHIBA EXCITE WRITE

\$600



PROS

- Unskinned Android
- Wacom digitizer responds well to pen input
- One of few 2,560 x 1,600 tablets

CONS

- Display shows muted colors
- Awkward speaker placement
- Uneven performance

BOTTOMLINE

Toshiba's Excite Write reads well on paper, but its execution leaves a lot to be desired. Consumers are better off spending that \$600 elsewhere.



THE SPACES BETWEEN

**Transforming Cape Town's
unused TV frequencies into
conduits of change**

By Darren Murph

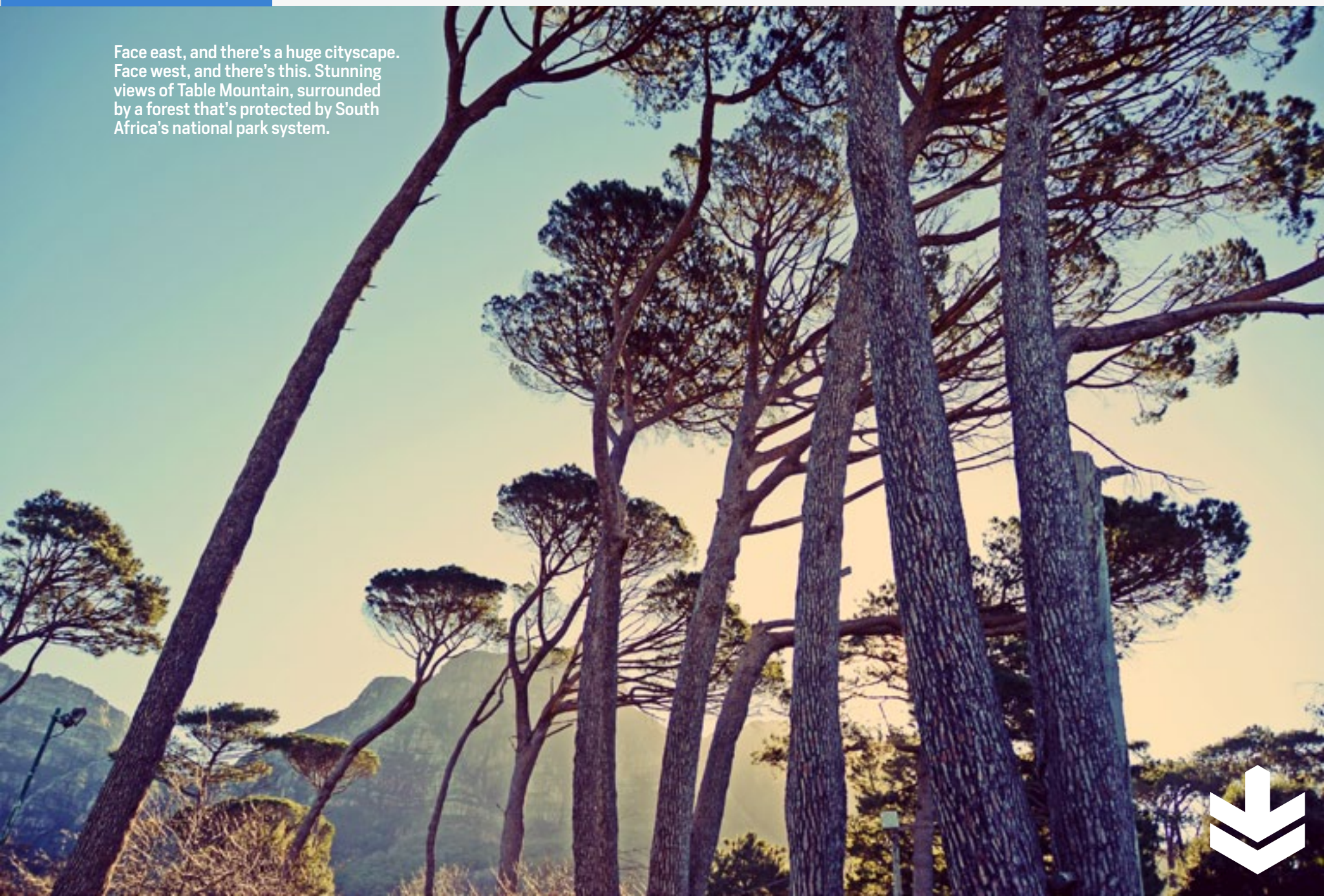


PHOTOGRAPHS BY DANA MURPH



IN 2011, a United Nations commission came to a powerful conclusion: access to broadband internet is a basic human right, matched by the likes of housing, sustenance and healthcare. Arguments can be made that widespread access has transformed entire economies while kick-starting others, with Finland even going so far as to command its ISPs to provide 1 Mbps connections to all homes regardless of location. Both the United States and the United Kingdom have similarly ambitious plans, and all three of these countries have one particular catalyst in common: funds.

Face east, and there's a huge cityscape. Face west, and there's this. Stunning views of Table Mountain, surrounded by a forest that's protected by South Africa's national park system.



The harsh reality, however, is the economies that stand to gain the most from sweeping internet adoption are also the least equipped to enable it. In early 2010, the European Bank estimated that a project to roll out passive optical fiber to 33 cities in the Netherlands would cost nearly €290 million. The mission driving such funding? “To stimulate innovation and keep Europe at the forefront of internet usage.” It’s the answer to a problem that could undoubtedly be categorized as “first world,” but consider this: Internet World Stats found that 92.9 percent of Holland’s population routinely used the world wide web in 2012. Let’s just say it’s easier to invest in an initiative that you’re certain nearly 9 in 10 citizens will use.

In the whole of Africa, just 15.6 percent of residents are connected to the internet, which is under half of the world average. It’s also home to vast, inhospitable landscapes that are economically inviable to crisscross with fiber. All of that being said, nearly a sixth of the globe’s population resides on the continent, representing a monumental

opportunity for something — *anything* — to connect the next billion people. As it turns out, there are actions presently ongoing to make a significant mark in the course of history. Google, Microsoft, Carlson Wireless, Tertiary Education and Research Network of South Africa (TENET) and a host of other powerful entities are collaborating to bring high-speed internet to an underserved continent via TV white spaces — a low-cost, highly adaptable technology that’s poised to explode. For now, Cape Town, South Africa, is acting as a proving ground for what will eventually be a far larger experiment. The core goal is actually quite simple: to beam hope to a disconnected society, with unused bands between TV channels acting as the medium.

DECIPHERING THE WHITE NOISE

For the myriad companies involved, simply educating consumers on how TV white spaces (TVWS) work is a challenge. I’d argue that the terminology (and in turn, branding) could use a bit

IN THE WHOLE OF AFRICA, JUST
15.6 PERCENT OF RESIDENTS ARE
CONNECTED TO THE INTERNET,
WHICH IS UNDER HALF OF THE
WORLD AVERAGE.





Darren Murph [left] speaks with TENET's Arno Hart about the potential implications of providing stable broadband where there was none.

of work, but the gist is perfectly comprehensible. As it stands, television broadcasts travel over predefined frequencies, which can essentially be envisioned as bowling lanes positioned side by side. In practice, broadcasters only use *every other* lane to transmit, with the lanes betwixt left open as a buffer. From a broadcasting point of view, the worst-case scenario involves the bleeding of one channel into another — hence, a buffer channel. To continue the analogy, it's certainly possible to imagine a pitiful bowler hurling a ball into the lane beside him, but it'd be practically impossible for him to accidentally toss it *two* lanes over.

Regardless of whether a nation broadcasts using analog (as in South Africa's

case) or digital (as is happening in the United States), the description remains valid. The overarching goal of the White Spaces Coalition — which was formed in 2007 by the likes of Google, Microsoft, Dell, HP, Intel, Philips, EarthLink and Samsung Electro-Mechanics — was to make use of the buffer channels for something greater. In other words, they want to turn lanes of broadcasting security blankets into active channels for wireless internet distribution. In the case of the Cape Town trial, Google was responsible for providing the funding and guidance, while Carlson Wireless provided the hardware and TENET executed on the ground.

Arno Hart, a project manager for TENET, explained it as such: each empty channel that's purposefully unused by



TV broadcasters has the potential to be used for showering schools, hospitals, playgrounds, libraries and entire communities with wireless internet access. Why *wouldn't* the world at large be interested in making better use of what's already there?

As it turns out, the biggest hurdle isn't a philosophical one — it's a mathematical one. TV broadcasters aren't fond of allowing any other wireless service to encroach on their transmissions. If a rival broadcaster (or, indeed, an internet connection served by a TVWS base station) were to transmit in an immediately adjacent channel using too much power, interference and visual degradation would occur. So, in order for TV white spaces to ever be taken seriously, those in favor of pushing it needed a way to definitively show that it could operate *without* causing quality nightmares for the TV stations next door.

COVERING THE CAPE

In 2007, the Federal Communications Commission found that early white space hardware simply didn't function consistently enough. Said equipment was engineered to sense when and where TV broadcasts were happening, and then direct its own internet signals around it. In testing, however, it wasn't able to stay in its own lane with a high degree of certainty.

A lot has changed in the six years since.

TENET's Hart recently met me at the Stellenbosch University Faculty of Medicine and Health Sciences complex in the

Radios and miniature computers fit in a case no larger than a mini-fridge; there's enough wizardry here to manage wireless internet connections to 10 schools simultaneously.



northern suburbs of Cape Town. At the time of my visit in mid-July, Hart was overseeing an elaborate trial that fed 10 nearby schools access to the internet via a wireless distribution method that simply did not exist a decade ago. In a pair of nondescript, metal boxes capable of holding less cargo than the suitcases I used to travel here, sat the tools necessary to make all of this wizardry happen. A fiber backhaul cable was jacked in, along with three TV white space transceivers. These rack-mounted boxes were concocted by Carlson Wireless — a rural communications company that recently saw its hardware used to bring internet to sparsely populated sections of California's Gold Country.



TENET's Hart is responsible for managing the entire Cape Town trial, which includes daily conversations with teachers who are using TV white-space connections to educate thousands of students.

WELL BEYOND MY OWN LINE
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From there, a trio of antennas were adorned on the rooftop of the aforementioned facility, with each one responsible for both sending and receiving internet signals from three or four schools. Hart informed me that each participating school had a nearly identical antenna and transceiver box pointed roughly in the direction of where we were standing, with the most distant positioned around five kilometers away.

I squinted a bit in an attempt to cut through the haze hovering over the city. Well beyond my own line of sight sat a trifecta of schools connected to an endless stream of knowledge using a bare-bones hardware arrangement that is

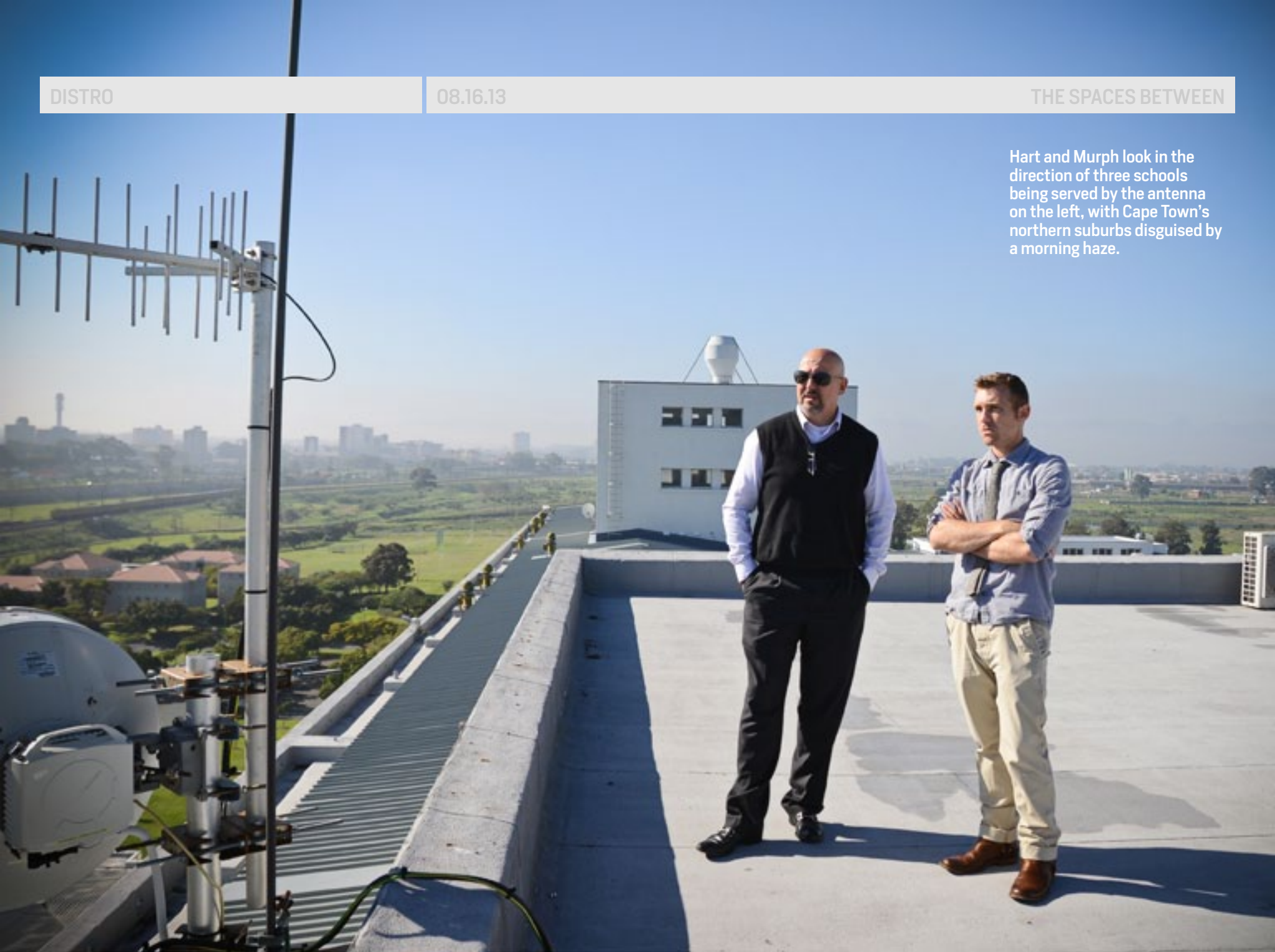
hardly more complex than your average radio setup. An arrangement that, according to Hart, “costs around one-tenth the price” of a cellular alternative.

In May of this year, decision makers from some 15 African nations joined as one at the TV White Spaces & Dynamic Spectrum Africa Forum in Dakar, Senegal. The goal was to understand how this technology could provide a cost-effective solution to connecting millions upon millions of Africans, dispersed across many thousands of miles. This half-year experiment in the heart of the Western Cape will largely determine the opinions of those who wield the power to implement it elsewhere.

“If TV white spaces can work here, it can work anywhere,” Hart said.

Table Mountain soars high above a dense and sprawling Cape Town cityscape, dividing the rough and tumble working district from the pristine coastline — an area that seems to be perpetually on holiday. The city is home to the most crowded television spectrum in all of South Africa and due to the mountainous terrain, effectively every available even-numbered channel is spoken for. These channels are used to broadcast analog television networks to many of the city’s 3.75 million people, and as such, the Independent Communications Authority of South Africa (ICASA) has to be extremely careful not to green-light a technology that interferes with another. As Hart described it, the technology used here has effectively no margin for error. Data col-





Hart and Murph look in the direction of three schools being served by the antenna on the left, with Cape Town's northern suburbs disguised by a morning haze.

lection will occur 24/7 for the entirety of the trial, with regulators watching intently for even a hint of cross contamination. If at any point the TVWS signals cause interference or degradation in neighboring TV bands, it's going to be mighty tough for proponents like TENET and Google to overcome. When asked the obvious question, Hart turned his head from left to right: "There's been absolutely no interference thus far."

IMPACTING A GENERATION

The reality of what's possible when connecting entire villages, cities, coun-

tries and continents to a stable, high-speed internet connection is nothing short of breathtaking. Last year, I traveled to Samoa, an independent island nation in the middle of the Pacific Ocean, and discovered a society that was experiencing broadband for the first time — not via wire, but via unseen waves of HSPA+. It transformed a hotel owner's ability to showcase her property on the web, to respond more quickly to booking inquiries and to gather more intel about the nature of her incoming guests' preferences. It's one example of a life altered merely by having access to the web at large, but it doesn't take a



visionary to understand the global impact of such a change happening to *everyone* in a given area.

While situated on a dock at the V&A Waterfront in the city's downtown area, it's shockingly easy to peer around and mistake Cape Town for a city without woe. There's an atypical amount of nature surrounding the obligatory concrete; avant-garde brands like Aston Martin and Burberry dot the coastline; and practically every face employed by the service industry dons a smile. Outside of the pampered tourist spots, however, struggles are evident. Dilapidated housing lines entire streets, while steel fences and padlocks are common lawn ornaments.

Despite having the largest economy in Africa, there are extreme deltas between the haves and the have-nots in South Africa. According to the latest United Nations Development Program (UNDP) report, around a quarter of the population is unemployed and living on well under \$2 per day. But, as I learned during discussions with Hart and Anton Kruger, owner of local network vendor ABIT, even those who *can* afford internet are often given a product that would be wholly unacceptable by American standards. In particular, Hart pays "around \$110 per month for 2 Mbps ADSL service," and the packet loss is so severe that he "cannot remotely connect to his work machine

Anton Kruger [center], owner of local network vendor ABIT, initiates a speed test in a computer lab at Parow High School, where students are now served by a ~4 Mbps connection in each direction.



through a VPN service.” Naturally, this personal frustration is an opportunity for a company like Google, which can grow by removing barriers for users who’ve yet to experience its ecosystem.

To that end, I had an opportunity to speak with Alan Norman, Google’s spectrum lead, who explained that the 10 chosen schools were selected in order to prove that TVWS was a viable and affordable last-mile solution. For those unaware, that’s geek speak for getting internet access from a terminal box to potentially hundreds or thousands of nearby homes, apartments, etc. Hart continued by explaining that each of the chosen schools *had* access to the internet using ADSL connections, which are quite common in South Africa. The idea here was to intentionally pit TVWS against the only real alternative that exists — an alternative that’s wildly expen-


sive and bizarrely unreliable.

According to Norman, “access is critical to Google’s business — the whole business depends on people having access to the internet.” That’s a fairly unabashed explanation of things, but it also sheds real light on why Google is so interested in facilitating such a trial. (Hint: it’s money... and altruism, but certainly money.) Specifically, he informed me that Google’s two primary goals here were as follows: “Proving a user benefit — that it can provide last-mile access to a school with sustainable broadband speeds — and to show that Google doesn’t interfere with the operation of televisions.”

Most of these schools — which have between 800 and 1,300 students apiece — relied on a 2 Mbps ADSL connection. In my estimation, that’s woefully inadequate for even a single-person small

MANY OF THESE TEACHERS HAVE
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Students trickle out as the final bell rings at Parow High School, where many are able to walk home from the school's central location.

business in the United States, and I've certainly heard my share of loud sighs as my wife and I competed for throughput on the 10 Mbps connection we have at home. One school in particular had a pair of 8 Mbps connections, but the *actual* speeds (as opposed to advertised) were so sluggish that it had to divide its email and internet access. Teachers couldn't afford for their email to grind to a halt whilst a class of pupils engaged with an interactive frog dissection on the web.

Beyond that, I noticed a stark difference in perception of what the internet is, and what it is capable of. Many of these teachers have only known an internet where sending an email with attachments in tow is a 15-minute ordeal,

and loading a single YouTube video as a means to educate requires more patience than it's often worth.

Due to the TVWS equipment being directly connected to TENET's historically reliable fiber ring, the educators I spoke with exhibited visible signs of relief and gratefulness when asked about the experience.

"There's just no comparison," said Shawn Schlosz, deputy principal at Cravenby Secondary School. "Before, I would have to download a YouTube video at home, load it onto a flash drive, bring it to class the following day and display it on a projector. Now, I have student pairs load the page on a shared netbook and follow along on a more personal level."


The trial routinely delivers upwards



of 4 Mbps in *both* directions — upstream and downstream — and even with pre-production equipment, most schools have only dealt with one or two momentary outages thus far. As one instructor put it, “I would’ve never known it went down, but the fallover to ADSL caused me to notice an immediate speed change.”

Gerdus Nieuwoudt, an IT teacher at The Settlers High School, described how the newfound speeds and reliability enabled him to create a cloud-based ecosystem for teachers to universally sign in to upload student scores, progress reports and syllabi. As it stands, computer databases are rare in these schools, and they’re all offline and al-

together disconnected by nature. Combining this data and hosting it online will dramatically hasten the record-transfer process should a student need to change schools, and one can imagine the benefits if like-minded instructors across Cape Town are able to collaborate online when it comes to overhauling syllabi and course requirements. In fact, one teacher was recently able to engage in a video-driven Skype call for the first time ever at school. Hearing her describe the experience — replete with jubilation and exuberance in her voice — was akin to hearing Evel Knievel speak of his first long-distance motorcycle landing. “I could see their faces,” she exclaimed, “and the interac-



By and large, students in Cape Town still spend their breaks conversing with one another face to face. Admittedly, widespread WiFi access could one day lead to more faces buried in phones.



tion was just so much more pleasant.”

In many ways, the trial provides access to the *real* internet — the one that can only be truly understood with a broadband connection — to these students and teachers for the very first time. Every single administrator I spoke with confirmed that they are committed to working with TENET and local authorities to continue receiving internet via TVWS once the trial concludes in October. Hart suggested that the services will be offered at a price that matches or bests those offered by ADSL providers, making the switch for those involved a practical no-brainer.

THE NEXT BILLION

While the official trial has yet to finish, it's obvious that those impacted most directly have already drawn their own conclusions. And, so long as TV broadcasters continue to be unaffected by its use, TV white spaces stand a great chance at becoming a legitimate last-mile option for ISPs. In many cases, the economic unfeasibility of running conventional last-mile cabling to lower-income areas creates a wretched cycle — these citizens could benefit greatly from low-cost computing devices as well as stable access to the internet, but their inability to pay up front prevents that from ever happening. Beyond the potential issue of airwave contamination, the other obstacle that TVWS faces is a common one: business justification. Implementation costs are 10 times lower than conventional cellular tow-

ers, but service providers would still need to forecast a large enough paying population in order to validate the initial outlay. In many cases, communities don't possess the computers necessary to connect to the internet, further hurting their chances of TVWS reaching them. But, as smartphones creep into historically low-income regions, the groundwork for an interested customer base could be established.

I'm not suggesting that for-profit ISPs will utilize TVWS technology to philanthropically blanket underserved areas, but if governments and nonprofit institutions are able to deploy internet access to more places on a more cost-effective basis, many of those presently unable to further their own education and research their personal ambitions could at least stand a chance to do so. Initially, those who stand to benefit are local ISPs (who will now have another distribution method to sell) and internet-craving citizens with the means to purchase monthly access for their homes. But it's the second wave of beneficiaries that matter most. Due to the low cost of implementation, schools, libraries, restaurants, laundromats and untold other public facilities will soon have a viable and affordable option for getting connected. Patrons of those facilities will be exposed to broadband, as the children in these 10 schools are. While no plans currently exist to blanket entire regions that are home to historically underserved and impoverished communities, there now exists a technology that would enable such a real-






Table Mountain towers behind Cape Town's V&A Waterfront — a hugely important tourist destination in the Western Cape.

ity at a far more sensible cost than mass cellular rollouts.

In merely three months, one trial school in particular has already had to erect a wall that disallows the use of torrents during school hours. A cynic may suggest that this is proof-positive that giving more access to students will simply lead to more misconduct and require more oversight to see that it's used properly. I disagree. The thought that unfettered access to a high-speed connection could spark that level of curiosity in a child's mind is astounding. Sure, they may dabble in nefarious corners of the web as they learn the ins and outs, but what other universally accessible tool exists today that is capable of causing such mental stimulation? A great deal of future innovation could stem from the process of connecting malleable minds on a grand scale.

Earlier this year, Google's Executive Chairman Eric Schmidt stated the following during an interview in New York: "In [the developing] world, just going from no bandwidth to any bandwidth is huge. The truth about technology is that it's relatively neutral with an empowerment bias. So, it's easy to come out with a positive view. But, there are things you have to manage — terrorism, et cetera. When [Alexander Graham] Bell invented the phone, he didn't make clear that criminals could use the phone to engage in crime."

But, really, who would say the world today would be better off without the telephone? 

Darren holds the Guinness World Record for being the most prolific professional blogger on planet Earth. He's also an argonaut.

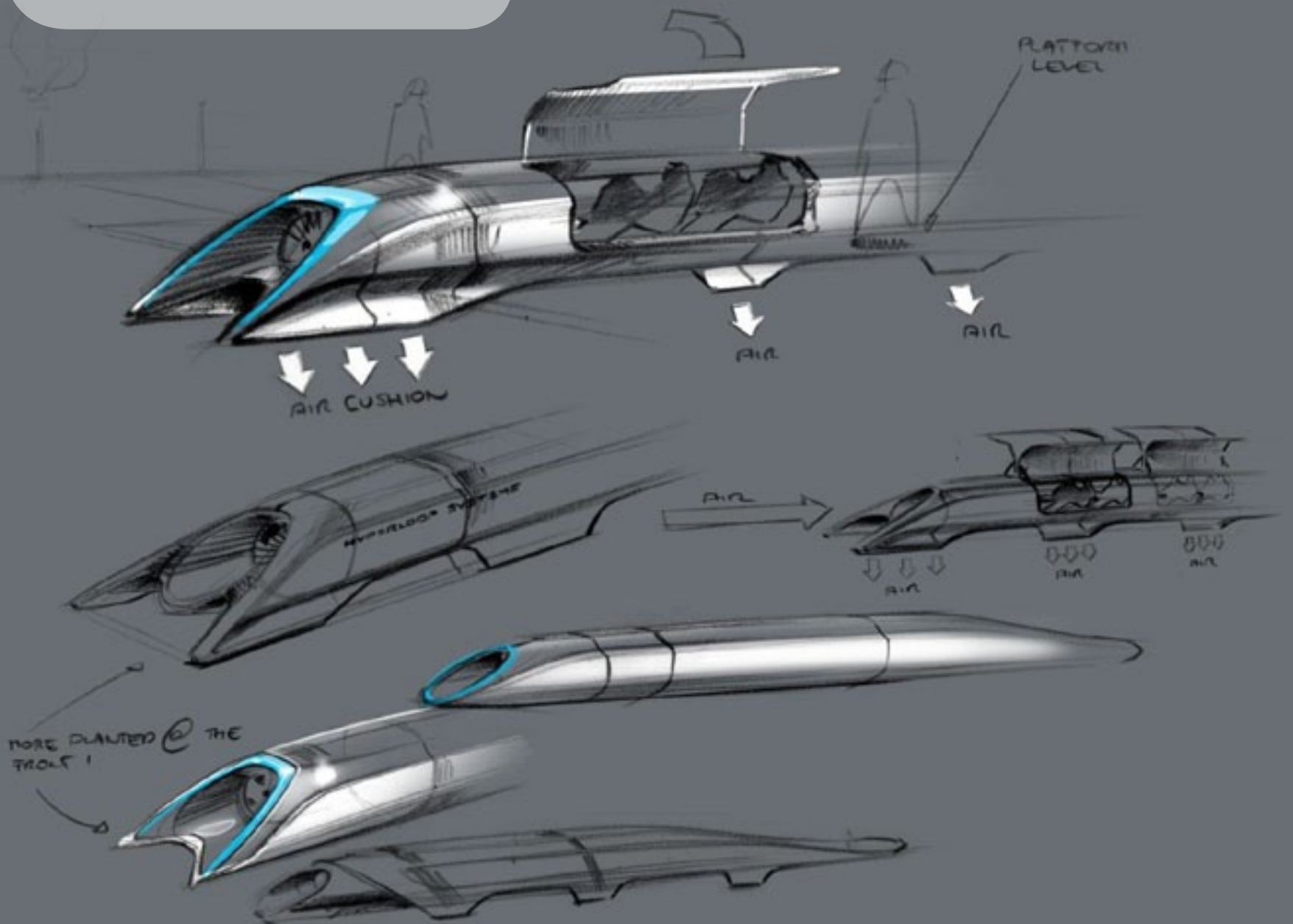


ESC

DISTRO
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VISUALIZED

HYPERLOOP



CREDIT: TESLA MOTORS

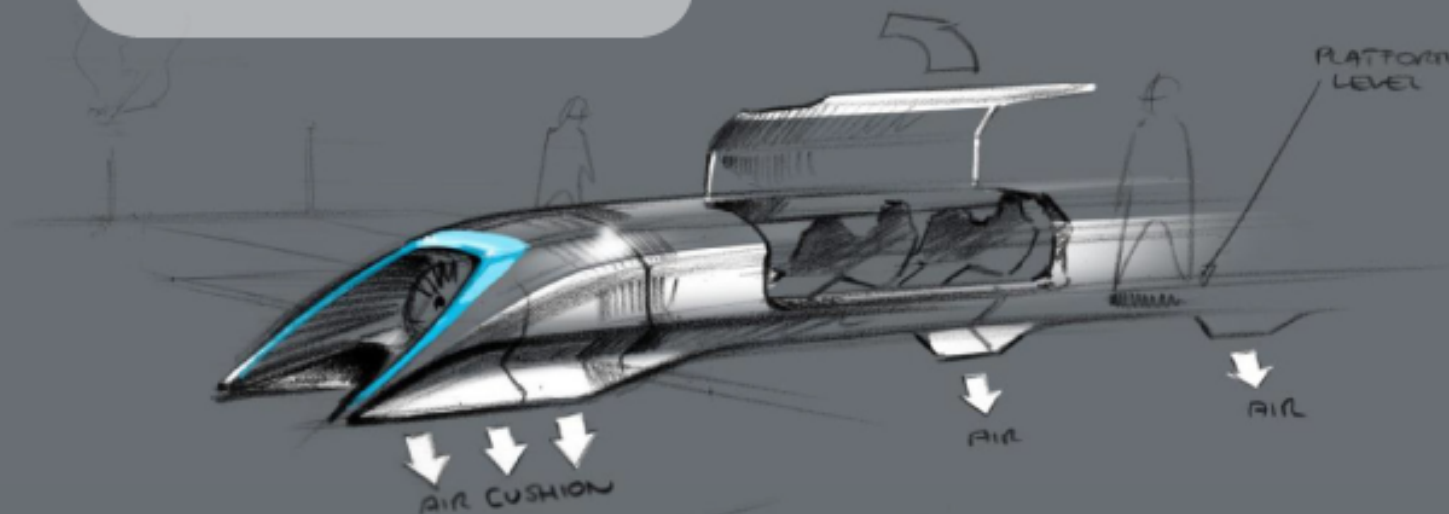


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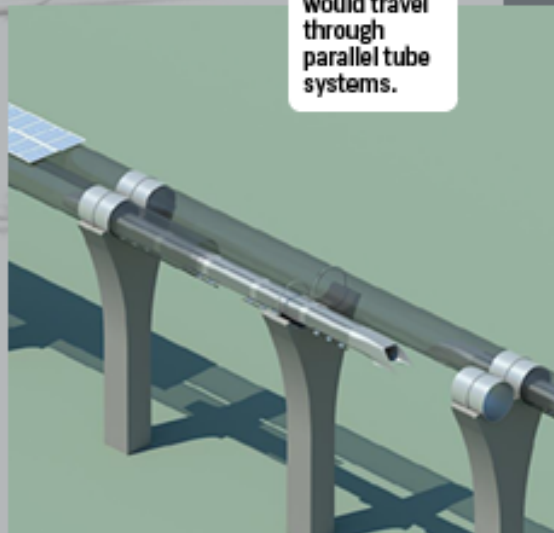
HYPERLOOP



Elon Musk has a habit of finding forward-thinking solutions to today's transportation needs, from highways to high orbit, and he's been spurred into action again by California's recent green-lighting of a new high-speed rail (HSR) system between San Francisco and Los Angeles. Finding issue with the HSR's cost, efficiency and relatively slow speeds, he offered his own solution: the Hyperloop. He envisions passenger pods speeding through aboveground tubes at upwards of 700MPH and completing the journey in just 35 minutes (compared to the HSR's 2.5-hour trip), and at a fraction of the cost and environmental impact. Musk presented the Hyperloop as an open-source project with hopes that collaboration could help bring this high-speed subsonic conveyance to reality.



Capsules would travel through parallel tube systems.



CREDIT: TESLA MOTORS



BLACK MILK



THE HIP-HOP ARTIST on wireless workspaces and the dangers of an unfettered iPhone

What gadget do you depend on most?
iPhone.

**Which do you look back upon
most fondly?**
Nintendo.

**Which company does the most to
push the industry?**

Macs are the standard in a lot of recording studios. Since I spend most of my time making music and on my iPhone, I'd have to go with Apple.

**What is your operating system
of choice?**

I'm using OS X Mountain Lion on



“Before smartphones, it was so much harder to do simple stuff like cutting and pasting ... Cutting and pasting is underrated.”

my laptop, but a way older version on my desktop. I am terrible when it comes to updates.

Which app do you depend on most?

My life revolves around music, so I use the basic Notes app on my iPhone to write song lyrics and for other things like grocery lists and to-do lists. I also use Shazam to ID songs I hear when I'm out and about. I like that it keeps a log of the songs, so I can go back to them later.

What traits do you most deplore in a smartphone?

A short battery life.

Which do you most admire?

I travel a lot, especially when I'm on tour or doing spot dates to promote a new album, so I like that I can do almost anything from my phone (like answer this questionnaire). Before smartphones, it was so much harder to do simple stuff like cutting and pasting text from one place to another. Cutting and pasting is underrated, haha.

What is your earliest gadget memory?

I had a pager back in the day.

What technological advancement do you most admire?

Wireless technology. I have a simple setup to make music, but there are still cords running all over the studio. Anything that can run wirelessly helps to clear the space and makes things feel more organized.

When has your smartphone been of the most help?

When I need to record an idea or melody for a song or beat that pops in my head. I'll immediately go to my "voice memo" app and record it. That happens almost every day.



If you could change one thing about your phone what would it be?

Better battery life and an exterior that doesn't shatter when dropped. I don't like to put a case on my iPhone. It's lighter and better looking without a case. The downside is that at least once a year, I'll drop the phone so hard that the screen or back will shatter. I actually dropped it at SXSW this year and still haven't gotten it fixed.

“I don't like to put a case on my iPhone ... The downside is that at least once a year, I'll drop the phone so hard that the screen or back will shatter.”


What does being connected mean to you?

Being aware of and knowing how to take full advantage of the information available on the internet and using that information one way or another to benefit your life on a daily basis.

When are you least likely to reply to an email?

If a person doesn't text my phone to let me know they've sent me an email, it will take me a few days to even see it in my inbox. I'm terrible at checking my email on a regular basis. Also, if the email is long, I'm probably going to put it off.

When did you last disconnect?

I somewhat disconnect at some point of the day every day. I'm so focused on my music that I will go hours without looking at my phone or the internet. I won't tweet for a month. It might not sound like a long time, but when some people can't go even 10 minutes without looking at their phones, a month without tweeting is an eternity. In terms of a more long-term disconnection, I'd say that occurred in 2011 after my last solo album came out. I had to disconnect from the industry and put myself in a bubble to perfect my craft. 



IN REAL LIFE is an ongoing feature where we talk about the gadgets, apps and toys we're using in real life.

SIGNEASY DIGITAL SIGNATURE APP



Motorola
Droid
RAZR M

SIGNEASY IS AN APP that I've been using for well over a year, and frankly, it's one of the reasons I just can't switch to Windows Phone. Presently, the app is available for iPhone, iPad, BlackBerry and Android, and it has become such an integral part of my working life that I honestly can't imagine going back to a time without it. In a

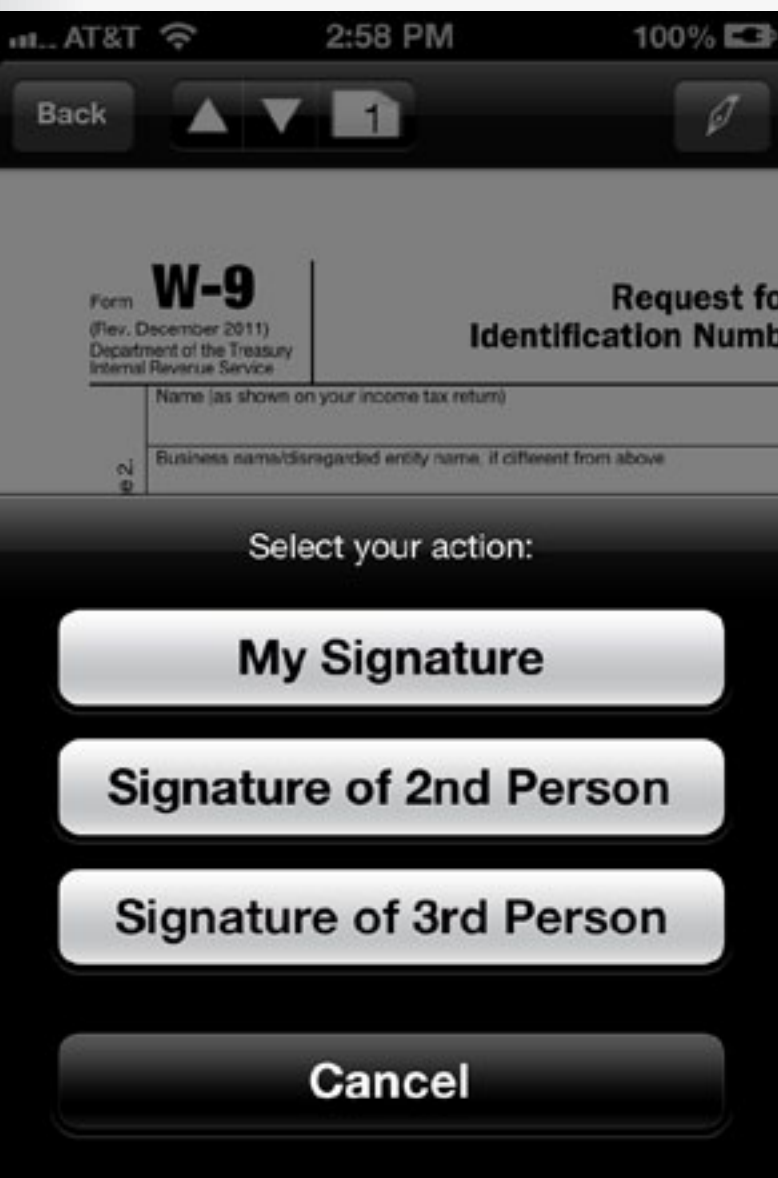
nutshell, the app allows you to download documents from your email and annotate them. Checkmarks, dates, addresses, et cetera. Once you've punched all of that in, you're able to save your signature and toss that in as well. (As a bonus, you can save up to

three signatures — one for you, one for your spouse and one for your weekend fling. Kidding!)

I've filled out 20-page real estate documents using this app, and it's enabled me to turn around contracts in record time. The alternative, of course, is hunting down a printer, an ink pen and a scanner / fax machine. Ugh. New users can sign and send (or upload directly to Dropbox) three documents for free. Beyond that, you'll need to pony up \$1.99 for five documents, or pay a \$19.99 / year subscription fee that grants you unlimited access.

In my extensive testing, I've seen the app crash a handful of times when trudging through long, multi-page documents — particularly when you're stamping a lot of text and signatures on each page. It's certainly not perfect, but it handles the majority of documents with poise. In fact, it's become a heck of a lot more stable with time, to the point where I'd wholeheartedly recommend it to anyone who detests the print / sign / scan routine. It's worth it.

— Darren Murph

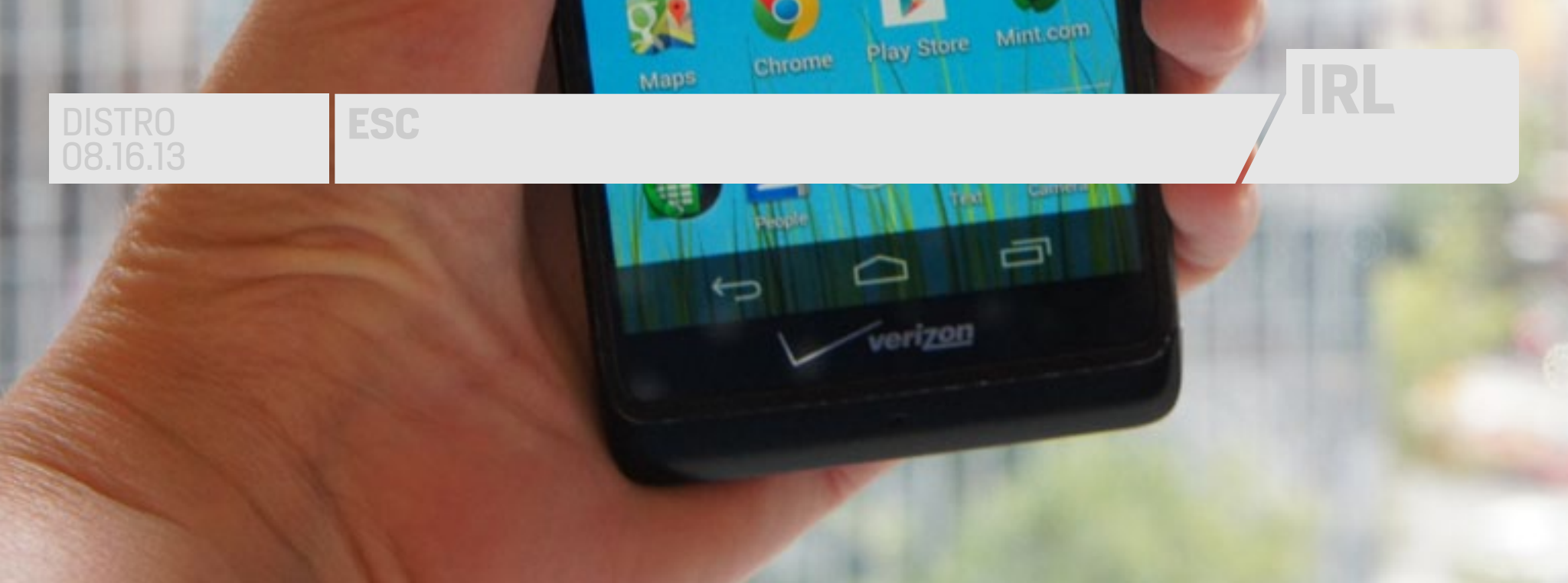


MOTOROLA DROID RAZR M

WHENEVER I MEET READERS, they always want to know what phone I'm carrying. In particular, I get the sense you guys expect me to own an iPhone, or a GS4 or maybe an HTC One. Because every time I pull out my Droid RAZR M, y'all look surprised. "That? That mid-range thing?" Yep, I'm a senior writer at a major gadget blog, and I use a phone with an 800 x 480 screen and a camera that's merely so-so. I mean, even when this was released, it was considered mid-range. Not the sort of thing our readers would lust after — and presumably not us editors, either.

But the thing is: it's actually a decent device. Let's start with the durability. I've dropped this thing more times than I can count (every other day for nine months) and the Kevlar backing is still pristine. So are the glass screen and the paneling up where the rear camera is. Save for a couple tiny nicks in each place, my only problem is that the phone is covered in fingerprints I'm too lazy to clean off. I dig the design too, especially the super-thin bezels that allow the screen to stretch nearly edge to edge. Sure, it's not sexy like an HTC One or a Nokia Lumia, but it at least isn't





as macho-looking as the original Droid, which I also used to own. Basically, it doesn't call attention to itself, and that's okay. Oh, and by the way, if you think 4.3 inches is too tiny, then you must not have little hands like mine. I like that I can comfortably hold it in one hand while clinging on for dear life in a packed subway car. I only wish there were more small phones I liked this much.

What I appreciate most, though, is that I'm running near-stock Android on a device that's not a Nexus. And the few software tweaks Motorola *did* make are ones I appreciate. That flipping circle showing the weather for different cities? I use it all the time, especially while traveling. And I love that I can swipe to the right to get a list of frequently used settings; anything I can do to save myself from extra tapping is always appreciated.

That said, I might be ready for an upgrade. The phone has slowed a bit, and I often wish I had a cam-

era that fared better in low light (daytime is A-OK). More than anything, though, it's the battery life that's let me down. The RAZR M never had great stamina to begin with, but it's declined even further in the nine months I've owned it. It's so bad now that if I'm futzing around on my phone before getting out of bed in the morning, I plug it back in while I get dressed, even if it's only at 95 percent. That five percent could be the difference between lasting the whole day and not, especially if I plan on staying out with friends after the work day is over. In fact, I'm unlikely to get the new Droid Mini, simply because I've no reason to think the runtime will be any better. That nagging issue aside, the M is a solid offering, especially for the price it cost back when it came out (\$99 on contract). I'd even be open to buying something similar the next time around — a discounted Moto X could be just the ticket.

— Dana Wollman



The week that was in 140 characters or less

News Breaking, Loop Scoops and Jetpack Promises

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REHASHED

@nickbilton

The NYTimes Website right now has taken the need for "more white space" a little too literally.

@pattonoswalt

Even if the
#hyperloop never
gets built, there'll
be an ice cream
flavor, a meth recipe
& a Brooklyn infant
named for it.

@nerdtalker

So I've been wondering
since seeing the news,
does the Samsung
Hennessy actually come
with Hennessy? Because
then I'd be interested.

@DjWeideman

That Martin Jetpack better be in my garage in 5
years. That's it. #RedEye #puttingmyfootdown

@LudwigK

Call of Duty: Ghosts is "more than an experience."
More than sensory mega-input. It exceeds hyper-
peripheral super-immersion brain matrices.

THE STRIP

BY SHANNON WHEELER

GAG REFLEX



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ESC

TIME
MACHINES

WHAT IS THIS?
TOUCH TO FIND OUT



SEIKO



SEIKO WRIST INFORMATION SYSTEM

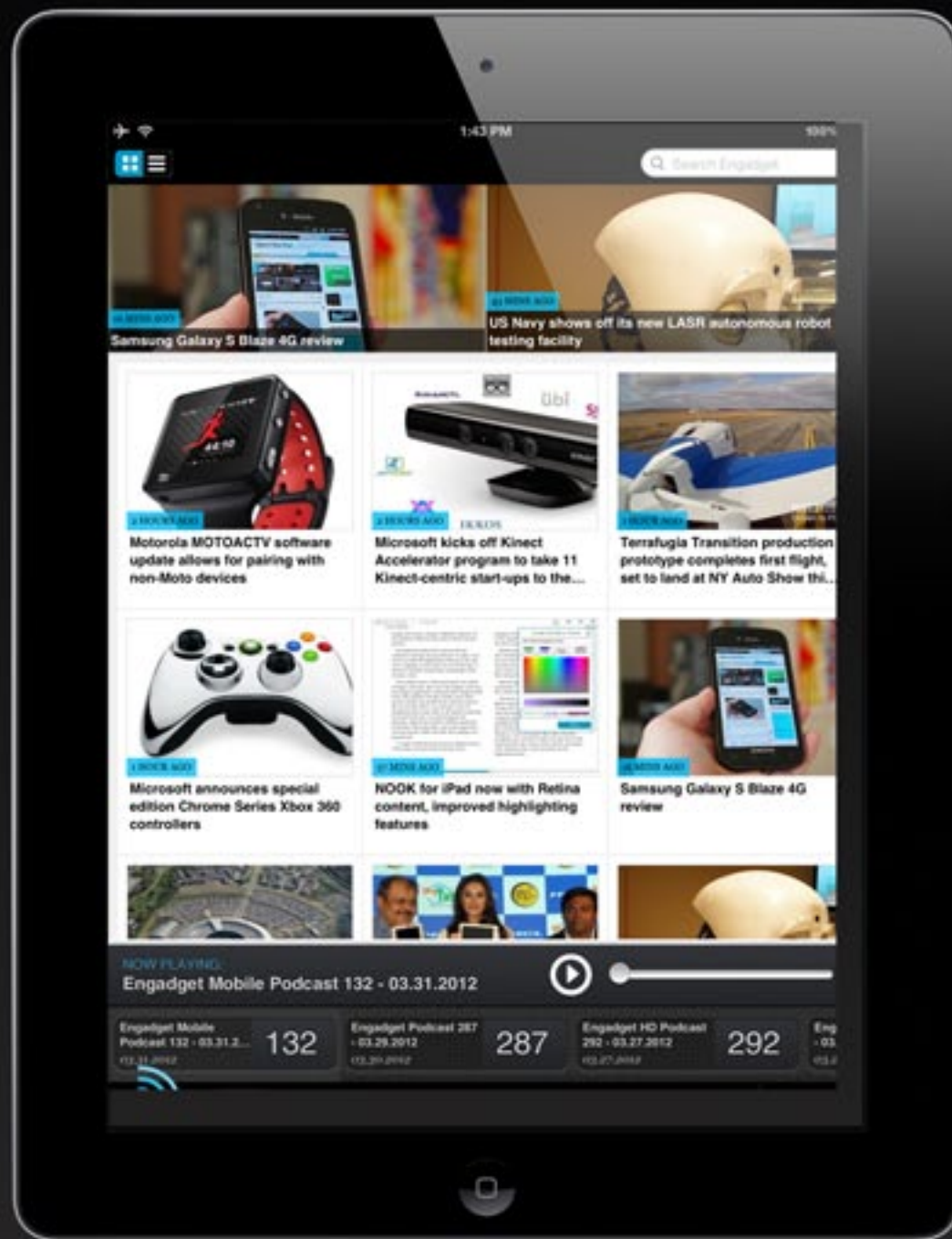


The year is 1984. There's a fresh copy of 2600 under your arm and you're strutting down the street in a "Where's the Beef?" T-shirt. You're tech savvy and willing to take some fashion risks that could expose your inner nerd. What better way than with Seiko's Wrist Information System to pull this whole look together? This '80s incarnation of the smartwatch communicated with a pocket-sized keyboard using a wireless transmission circuit and the watchface served as a display. Aside from timekeeping basics, the watch also came loaded with a selection of ROM applications for scheduling, playing games and even supported BASIC programming. For the truly geeky, a super-charged keyboard terminal was available, with 4K of RAM, expandable ROM kits and a spool-fed printer. Of course, the keyboard wasn't *meant* to be worn on the arm alongside the watch, but fashion should never get in the way of cyborg dreams.



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